I FOUGHT IN SPAIN *by* FRANK TINKER, JR.

POPULAR AVIATION

IN THIS ISSUE

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Jas. H. Hattie, Maintenance Division, Trans-Canada Airways, Winnipeg, Man.

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Benjamin A. Smith, Sheet Metal Department, Curtiss-Wright Airplane Corp., Robertson, Mo.

Alfred J. Schmidt, Maintenance Division, Pan American Airways, Brownsville, Texas

William Stair, Meteorology and Communications, Hanford Airlines, Kansas City, Mo.

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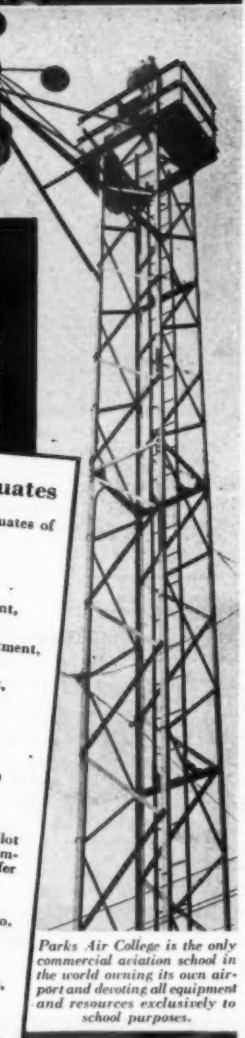

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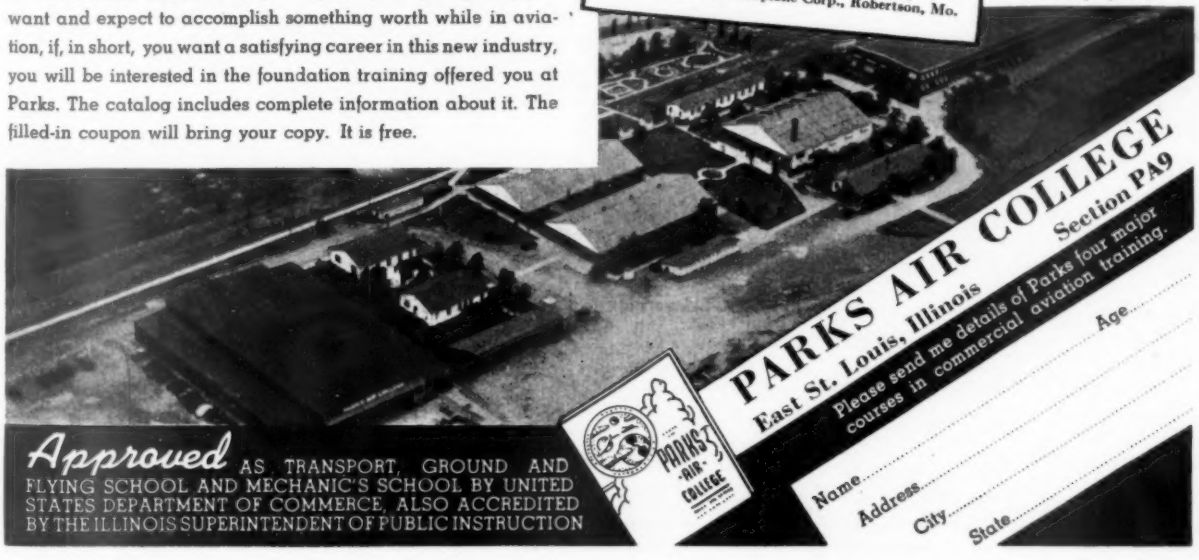

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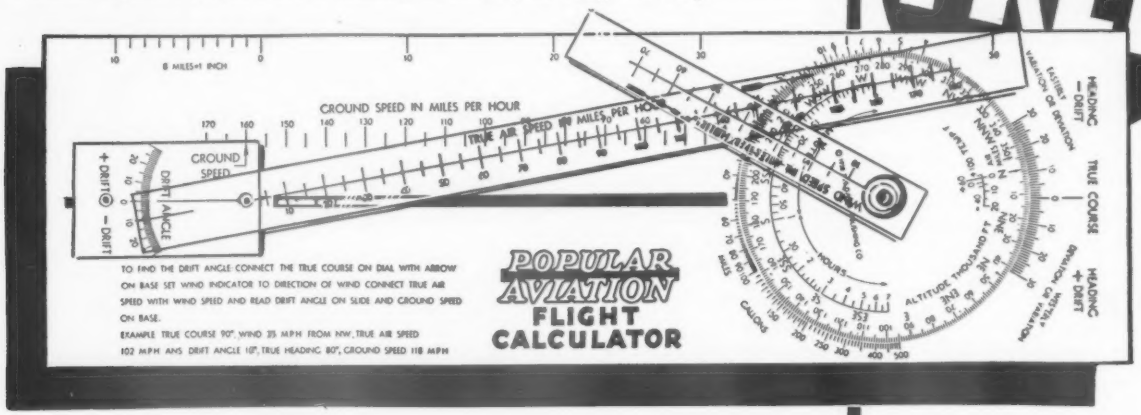
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Above: Line Service Work
Left: Reassembling an overhauled plane

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July	5	7	2
Aug.	4	2	2
Sept.	20	17	7
Oct.	4	3	2
Nov.	2	2	2
Dec.	29	7	3
1938			
Jan.	7	14	6
Feb.	1	9	7
Mar.	40	16	6
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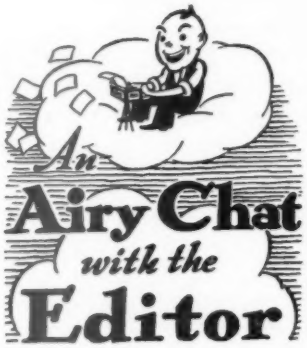
POPULAR AVIATION

Volume XXIII SEPTEMBER, 1938 Number 3



FOR more than two years, rumors have reached this office of a special radio transmitting device by which signals to pilots and a compass beam can be directed for the assistance of pilots without danger of being "jammed" by enemy all-wave broadcast. This invention is attributed to the U. S. Navy and we sure hope it's true, but we are still more ambitious to see the same device applied to airline traffic to penetrate static and other effects that tie the beams in bow knots.

* * *

THERE seems to be a great diversity of opinion between those who should know, whether the Russians are producing super-ships or whether they are simply poor copies of other planes. One camp, the affirmatives, claim that the Russian products outclass anything in the world so far as speed, maneuverability and fighting capabilities are concerned, while the other side claims that they are fifth rate and a poor fifth rate at that. Time will tell.

* * *

THERE is one thing sure, this season. The airports are filled with factory made lightplanes to an extent that is almost unbelievable, even with the celebrated Recession in full blast, where once shabby looking old Eaglerocks, Travel Airs and similar ships of similar vintage hung out, we now see bright and gleaming midgets of recent fame, airing their plumage. Just what will happen when prosperity returns (I hope) is only conjectural, of course, but I'm ready to bet that the air will be full of putt-putts scooting around in all directions. It is the first time that I've felt this way for years.

* * *

KIPLING may be responsible for his definition running to the effect that woman is a hank of hair, and some other odd parts, but he might have gone further and stated that a lightplane is but a hank of fabric and an armful of

(*Continued on page* 84)

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Cover Photograph: Seversky racer by N. R. Strohmeyer

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Editorial Offices: 608 S. Dearborn St., Chicago, Ill.

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POPULAR AVIATION is published monthly by the Ziff Davis Publishing Company at 608 S. Dearborn St., Chicago, Ill. William B. Ziff, Publisher; B. G. Davis, Editor; John B. Rathbun, Managing Editor; Max Karant, Associate Editor; Swanee Taylor, Advertising Manager. Herman R. Bollin, Art Director. New York Office, 381 Fourth Ave. Subscription $2.50 per year; single copies, 25 cents; foreign postage $1.00 per year additional, except Canada. Contributors should retain a copy of contributions. All submitted material must contain return postage. Contributions will be handled with reasonable care, but this magazine assumes no responsibility for its safety. Accepted material is subject to whatever revisions necessary to meet requirements. Payment will be made at our current rates upon acceptance and, unless otherwise specified by the contributor, all photographs and drawings will be considered as constituting a part of the manuscript in making payment.

I FOUGHT

We take pride in presenting this popular treatise on the men and airplanes flying in the Spanish Civil War. This marks the first time an authoritative article on this particular subject has been written for an American publication. The author returned from Spain not long ago after serving as a fighting pilot for more than a year.

The author and his Russian fighter. Note bullet hole patch in the 6. A close one!

Because of strict censorship this is a rare picture. Three mechanics posed behind famed "Whitey" Dahl (still a Franco prisoner), Chang Selles and Tinker (left to right).

AFTER recent publication of various aerial experiences in the Spanish Civil War, I was surprised at the amount of interest taken by pilots, in the planes we used. Also in the planes used against us. Of course, accurate description of some of the enemies' planes is impossible—as I only saw them in the air. However, I believe that I can give fairly accurate description of our own planes and will try to supplement descriptions of the enemies' planes with descriptions of their aerial characteristics. This combination should give a fairly good idea of their general attitude in the air.

When I first arrived in Spain we were assigned to the biplane fighters of the Boeing P-12 type. However, they had been developed by the Russians quite a bit. The most important development consisted of the Vee in the upper wing, of the gull type (affording better visibility); a more powerful motor; and four machine-guns. These machine-guns were all synchronized through the propeller. If I remember right, American planes of that type had only two guns.

Our standard squadrons consisted of 12 planes—in patrols of four planes apiece—but we very seldom had that number of planes ready for action. In fact, on several occasions we went out with as few as only four or five planes, others being temporarily out of action. When we were working on any particular front we would have anywhere from two to five or six squadrons or fighters. At least two of the squadrons would be monoplane fighters (of the low-wing type—developments of our Boeing P-26). They had neither struts nor flying wires, were equipped with a more powerful motor and had retractable landing gear. They carried two automatic machine-guns which fired outside of the propeller radius at a combined rate of fire of about 3,600 bullets per minute.

The fighters used by the Rebels at that time were Italian Fiats and German Heinkels. They were very similar in type—both having water-cooled motors—and were very heavy. They were biplanes and their speed was approximately the same as that of our own biplanes on the straightaway. However, their weight and streamlining enabled them to outdive our biplanes with at least a 50 per cent greater acceleration. Our planes, though, could both out-climb and out-maneuver them. The Fiats were better fighting planes than the Heinkels—being both shorter and wider—but their pilots were lacking in intestinal fortitude. Whenever we recognized enemy planes as Fiats, we would merely head in their direction and open fire with all four guns—they would almost invariably dive away and go home. When we tried those tactics on the Heinkel boys, though, they would open

So closely guarded that it was almost impossible to photograph them, these Russian-built biplane fighters are being used in Spain and China. These ships are developments of the American Boeing P-12.

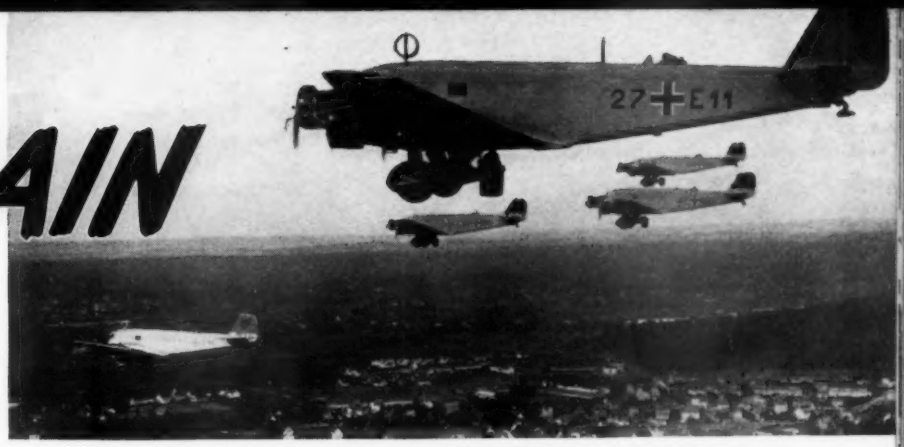
Photograph from Lyman Voelpel

IN SPAIN

by

FRANK G. TINKER, Jr.

Former U. S. Army airman who recently returned from Spain; author "Some Still Live."



"The first bombers we went up against were tri-motored Junkers. However, their center motor gave them a blind spot forward. Franco retired them from daytime operations.

The Russian fighters' powerful engines had to be started by the above device.

up and fire right back at us.

The first bombers we went up against were tri-motored Junkers. However, their center motor gave them a blind spot forward and, after losing many of them, Franco retired them from daylight operation and used them only for night bombardment. They usually came over in formations of either three, six, or 12 planes—with an escort of anywhere from 50 to 80 Heinkels above them. Our monoplanes usually took care of the escort while our biplanes were working on the bombers. The Junkers were very slow so we seldom had any trouble getting into position for a frontal attack. Just before the assault our squadron would go into an echelon of echelons and the planes would go in and down individually, with all four guns hammering away. Each plane would fire as long as possible, then go into a half-roll and dive away. The speed gathered in the dive would enable us to get into position for a second, and sometimes a third, firing dive.

After the tri-motors were retired from daylight service, the Junkers people brought out a bi-motored bomber which was very efficient. It was almost as fast as our biplane fighters so they were usually able to get away with any surprise bombardments they cared to pull off. Our monoplanes, though—when they were available—were fast enough to take care of them. These new Junkers had a double tail and our usual tactics were to get above and behind them, then dive down in line with one of the tails trying to get the rear gunners. After getting them the rest was easy, as they were defenseless from the rear without their services. However, we certainly appreciated having those big motors in front of us to deflect the bullets before we got the gunners. They were using twin .50 caliber guns, mounted on a bracket, and about every third bullet was of the explosive type. A formation of anywhere from three to 12 of those planes could really put out a volume of fire from their rear guns.

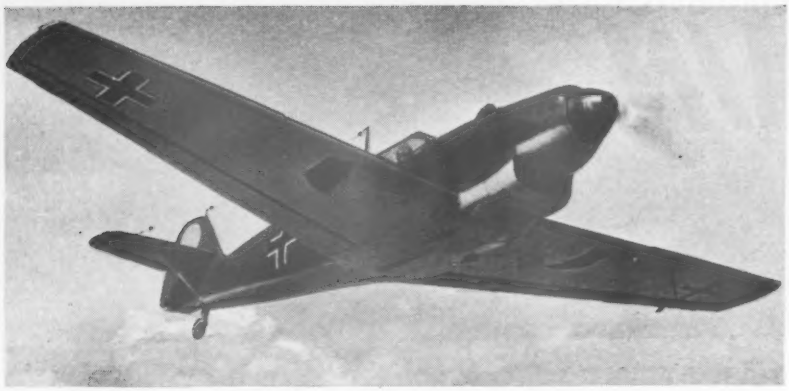
The Italians tried out one type of fighting plane about which there is still much controversy—a two-seater. I never did find out exactly what make it was, but it bore such a close resemblance to the regular Fiat fighters that I suspect it was put out by one of their factories. It was a colossal failure, though, and I saw it in action on only one occasion. It might have made a better showing if Mussolini's pilots had been as efficient as the Germans, but they were too panicky. As soon as we discovered that we were up against fighting planes with rear guns, we lured them into a series of violent maneuvers and their own pilots did the rest. In the resulting confusion they forgot all about their unfortunate rear gunners and went into evolutions which were so violent that the centrifugal force flattened the poor fellows against the bottoms of their cockpits. This rendered their rear guns useless and the extra weight of both gunners and guns made them too heavy to even hope to try to maneuver with our own planes. As mentioned before, we saw them but once, and they were the laughing stock of the war for some time afterwards.

Toward the last the Italians brought out a bomber very similar to the Junkers bi-motored job. It was known as the Romeo and was very fast—possibly even faster than the Junkers. Their usual tactics were to cross the lines at extremely high altitudes, then throttle back and glide over our fields with as little noise as possible. Fortunately, high altitude bombing is very inaccurate so that their principal effect was upon the morale of our pilots and ground crews.

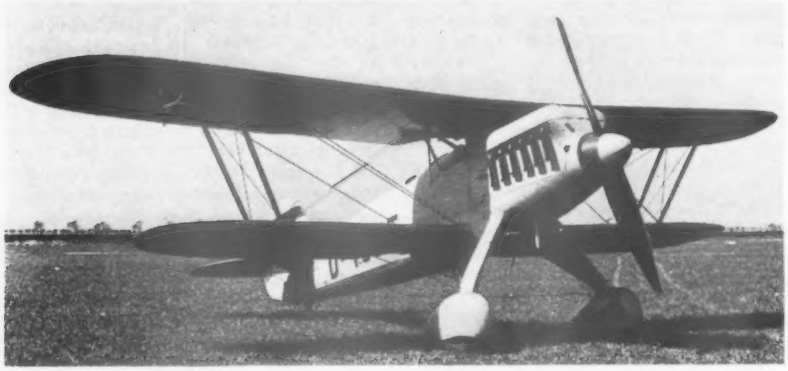
For instance, one morning we went out to our field at Campo Real and a couple of Romeos caught us by surprise. We had started our motors and warmed them up as per usual and tried out our machine guns. The noise of those operations made our ears ring and we were unable to hear the prowlers as soon as was customary. About five minutes after

The enemy dreaded the low-wing Russian monoplane fighters. Developments of the Boeing P-26, they had neither struts or flying wires, had a retractable undercarriage and two machine guns.

Photograph from Lyman Voelpel



The Messerschmitt was not very successful in Spain. It was one of these, however, that shot down "Whitey" Dahl. They were best at out-diving the Russian fighters.



Rebel bombers usually came over with an escort from 50 to 80 Heinkels with them for protection. The Heinkel (above) was woefully lacking in maneuverability, though.

The new twin-engined Junkers bombers had a double tail. Usual tactics were to get above and behind, dive down in line with one rudder and pick off the rear gunners.

Fiats (above) were better-developed than Heinkels, were much more maneuverable.

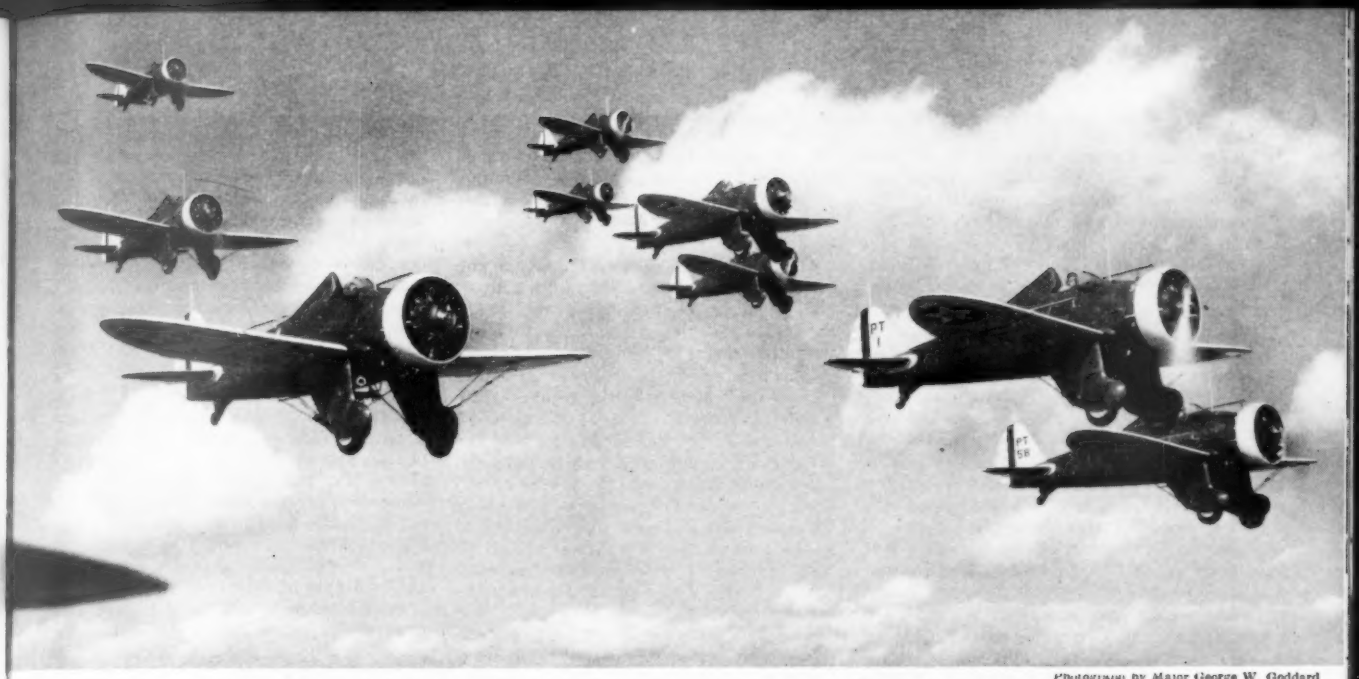
cutting the switch, I noticed people shouting and running for bomb shelters. When I glanced up I saw two enemy planes almost directly overhead. I immediately jumped into parachute and plane almost simultaneously and took off—just as our two red alarm flares went soaring up over the field house. Just as I cleared the ground I glanced back and saw the first of the bombs box the place where my plane had been. Then, as I came around in my first turn, I saw one of our taking-off planes intersect with one of the lines of bombs Its motor was torn completely off and the plane, which was making approximately 100 m.p.h., immediately nosed over and started sliding along on its back. Only two other planes besides my own got off the ground, as most of the pilots got the alarm too late and very wisely went into the bomb shelters. That was the only time they ever came near to catching us on the ground, but you can easily see how such occurrences could effect the nerves of over-worked pilots. The pilot of the wrecked plane had gotten away with no more injury than a slashed right shoulder—but he was so bomb-shocked that he had to be retired from active service.

Towards the last of my stay in Spain the Germans brought out a monoplane type of fighting plane—the Messerschmitt—which was not very successful, especially when opposed by our own monoplanes. They had water-cooled motors (our planes were using air-cooled *Cyclones*) and were better streamlined so they could out-dive us. But we were faster on the straightaway, could out-climb them, and could also out-maneuver them—which was most important. It was three of these planes which shot "Whitey" Dahl down. He was in one of our biplanes at the time and had made the mistake of wandering away from his squadron. Three of our own monoplanes got behind the Messerschmitts and shot two of them down—while the third utilized its diving ability to get away.

During our first few months of fighting over there in Spain we Americans noticed that both the Germans and the Italians seemed to have designed their fighting planes for diving, rather than maneuvering, purposes. The Italian Fiat was an almost exact copy of the German Heinkel. However, the Fiat had a shorter fuselage and was more maneuverable than the Heinkel. It must have been quite a shock to both Mussolini and Hitler to discover that our American 1928 model Boeings could both out-climb and out-maneuver their 1936 model fighting planes.

My personal opinion is that the Fiats were modeled along the lines of the Heinkel, but were better developed. Even with their water-cooled motors they could still maneuver with our biplanes. If there had been German pilots in those Fiat fighters there would have been an entirely different story after any of our dogfights. We could never understand what was wrong with those Fiat pilots—unless it was Mussolini's personal influence We had a "Garibaldi Battalion" which was composed entirely of Italian

(*Continued on page* 82)



Photograph by Major George W. Goddard

"The nine planes of one of the pursuit squadrons are maneuvering high in the sky while their commander puts them through the various phases of formation work." The above ships are Boeing P-26's.

THERE'S PLENTY TO DO!

by T-2003

Army airmen aren't the fair-haired boys the general public may think. Their life is a fast and hard one. Read this and see.

"I SHOULD think," remarked the friend of the Army flyer, "that you Army pilots would go nuts for want of something to do in time of peace. Something to keep you usefully busy. I know you fly around and keep your hand in on the stick but what *is* there for you to do in peace times when there are no enemy planes to shoot at?"

His host, the squadron operations officer, just grinned cheerfully. Keep him usefully busy, eh? Oh, heck, why try to explain. "Every day in the Army is like Sunday on the farm" a famous cartoonist had once remarked. A newspaper columnist, with all the assurance of ignorance, had just stated that, with only 200 hours a year flying to do, the Air Corps pilot's life was one round of spare time and amusement. True or not, these echoed the average civilian's conception of the Army aviator's existence. A lazy life, was it?

The flyer leaned back and silently reviewed the day just past. Out on the flying line at 7 a. m., after having taken charge of the squadron's reveille formation an hour previous (all the squadron's officers taking daily turns at that duty). He is operations officer, in charge of the squadron's flying and training activities, and the operations office is his hang-out; an office with a number of maps and a couple of charts of the squadron's pilots' flying time on the walls, and two clerks at a desk, checking up yesterday's missions and flying time. The outfit is an observation squadron. Not one of your long-range reconnaissance squadrons (which go far to sea or from the home base to precede or accompany the bombers), but a corps observation squadron, that drab workhorse of military aviation whose main mission is the close cooperation with the ground arms; the "eyes of the army" as it had been called. His first mission of the day, while the planes are being wheeled out on the line is the compiling of a flight schedule for this day's work.

"Eight O-46's in commission by 7:30, when flying starts," said the engineer officer. Holding one ship out for emergency missions and another for the ministrations of the armament crew means that six teams will start their training flights in a half hour. He plunges into draughting the flight schedule, forever consulting the chart which shows the various phases of work already successfully performed by the pilots and observers of the squadron for that training year; for a definite schedule of training in the various phases of air observation is continuous in observation squadrons, even for those flyers of wide experience. There's always more to learn.

Seven-thirty, and a half-dozen pairs of parachute-burdened young men climb into their respective airplanes and take-off. He could now run over to the Squadron barracks and see the Squadron Commander about the list of soldiers available to take the course at the Air Corps technical school—only the engineer officer drops in with a pessimistic "hello."

"Number Nine's engine; just been installed and needs an hour more easy workout before we use is on missions. Want to take it?"

"No objections," and the Squadron Operations Officer dons flying gear in preparation. It would be a relief to fly around for an hour with no hard work thrown in. The plane's crew chief, the normal passenger, is in charge of barracks that day. It might be a good idea to take one of those new men in the hangar—a recruit—for the hop. The sergeant sends a man over. A smart, handy-looking youngster, who gets well instructed in when and what and what not to do with his parachute and the controls and gadgets he will see in the cockpit he is about to enter.

It is mighty good to get away from the office for a spell, he thinks, as he climbs above the field to a decent alti-

tude. Below him two of his squadron's planes are cutting large circles around one corner of the field, their respective pilots and observers practicing the catching, with a weighted hook, of message bags on a line strung between two bamboo poles; one of the many jobs an observation might have to do in working with ground armies in time of war. Coming in for a landing on the field is a three-ship formation, two of the newcomers to the outfit being polished up in formation take-offs, landings, taxying, and short flights by one of the squadron old-timers in the lead. The nine planes of one of the other squadrons on the field can be seen in the distance, flying formation as one unit. Not much of that formation flying in obervation squadrons or groups. Not much need of it. In observation aviation it is mostly a case of two-men teams working as individual units.

Somewhere down the coast should be the sixth team of the squadron working communications with the coast artillery outfit there—might be a good idea to fly down and see.

A bit later, over the fort which guards the entrance to the harbor he spots the high-wing monoplane circling the parade ground where the ground troops are sending messages aloft by means of cloth panels displayed on the ground in various patterns, in accordance with a highly secret military code. With each complete message from the ground the observer writes an appropriate reply, tucks the message in a small canvas bag and with the pilot swooping down over the panel crew, hurls the bag earthward.

For ten minutes or longer, the squadron operations officer watches the process. The ground panel crew stand too close to their panels after displaying them. The observer should call their attention to this. The observer is taking too long to decode the panels messages.

"He needs more practice in that sort of work," decides Operations as he heads for his home field.

Upon landing he finds that the two message hook-up planes have landed and taken off again during his absence, with their former pilots and observers switching their respective roles, back to the same job of hooking up messages from the ground. The formation planes have also landed; their soldier passengers have been replaced by observers and they are all prepared for other missions. Two of them will climb to 10,000 feet to take mosaic photo strips of a section of the coast line with the heavy cameras now being installed in the planes. The other plane will soon go aloft to practice radio work with the squadron's ground radio section.

A "tat-tat-tat-tat-tat-tat" sound is heard from a far corner of the field. Number 5, her forward machine gun synchronized to shoot through the propeller, is in the hands of the armament officer for test. The plane has its tail blocked up to flying position, wheels firmly chocked and motor wide open, and is facing the wood, sand and concrete gun butts into which a steady stream of bullets is pouring from its .30 calibre Browning. Which reminds Operations that gunnery practice starts in two weeks and a plan must be drawn up for that.

Other matters, however, engage he immediate attention of this busy flyer. The squadron commander is waiting in the office on the flying line, together with the pessimistic engineer officer.

The business at hand is the selection of two soldiers to take the course at the Technical School. There's no question about one of the candidates to take the crew chief's course; a steady lad who has already served one three-year enlistment in the Air Corps and is now about to realize his 3½-year-old ambition to go to the school. The man who is to take the radio course isn't decided upon immediately. The commander hears the recommendations of the operations and engineer officers on the possible candidates. He calls in the radio sergeant for questioning. Then, when all candidates have been discussed, the squadron commander makes his decision. The operations sergeant hands his superior the sheaf of papers that have come into the office during the past hour.

From Washington—a new method of tabulating and classifying the flying time in the squadron. H-m-mmm, have to dope that out later and instruct the clerks accordingly.

From group operations—one team to tow the sleeve target for the anti-aircraft tonight. Well, no one likes that job on account of its monotony, but Lieutenant Harris is next in line for that job and he can take Sergeant Smith to operate the target reel. They'll take the group's Douglas O-25 with its 600 h.p. *Conqueror* engine; lots of power to pull the sleeve.

Funny thing about that towing job: every pilot tries his darndest to get out of it. Don't blame them, though; many's the lad who's found bullet holes in his ship's tail.

The next is a hot one—the Exchange Club in a nearby town would like to have him speak on Army Aviation at their luncheon next week. Sure, he'll phone them; invitations like that are part of the life of practically all experienced flyers, both civil and military. Must make a note of it; get the commander's permission and have the assistant operations officer for intelligence hold down his job for the few hours he'll be gone.

What's that phone call. Group operations speaking? About that assignment for tomorrow with the field artillery outfit across the mountain. Yes, he understood what it would be; spotting shots on stationary targets, communicating with two-way radio, one-way radio and ground panels, ground radio and drop messages, and no radio at all, just wing signals and ground panels. He was putting those two new lads who had just arrived from Kelly Field on the mission. They were good on radio and other communications and understood artillery procedure perfectly.

Well, that's all until 11 o'clock, except that the afternoon's mission with the nearby infantry division must be arranged for; as he and the squadron commander were flying that one as a team and special equipment would be needed—a camera for oblique shots, a message pick-up hook, message bags, a panel code sheet Very signalling pistols and shells, and radio; in fact all the paraphernalia that is ever carried in an observation plane.

It's after 10 o'clock now. Until 11 he can take it easy, except that the squadron adjutant phones him from the orderly room to give him a message about Captain White's forced landing yesterday. The base commander said the squadron in which the forced landing occurred should mop up all the details. Well, Whitey is one of the squadron's flight leaders, so the squadron commander just told the adjutant that operations, the adjutant (who was speaking) and one of the reserve officers in the outfit would compose the board to determine the damage done by White's landing gear in the potato and bean patch where he landed. And how, jeers the adjutant, does he like the job of garden truck evaluator?

Eleven o'clock rolls around. It finds our hero in another role. He is lecturing the nine younger officers of the squadron on the fine points of spotting the shots of the big guns of the coast artillery on targets far out, ten miles or so, at sea; of finding such targets against a background of whitecaps, gauging the distance from the ship-towed target to the shot's splash, and sending the data in by radio code to the battery doing the firing. It is one of the jobs in which he has specialized. He is responsible for the training of members of the squadron. Hence he has taken this lecture as a means of instruction. Later in the month he will give another short series of talks to the squadron on aerial photography, touching on the new developments in the past few years. The group photographic officer was to do that but he has an assignment up state on an aerial mapping job for the U. S. Coast and Geodetic Survey.

He is spared attendance at officers' call at group headquarters after the lecture in view of the afternoon mission with the infantry division. The mission will be a demonstration to all communications officers and detachments in the division of the work done and the equipment used by an observation plane in the coming summer's maneuvers.

In his quarters on the post he eats a hurried lunch. "I hear," remarks his wife, "that the list for next year's class at the Air Corps Tactical School down at Maxwell Field, Alabama, is coming out soon and that your name is on it."

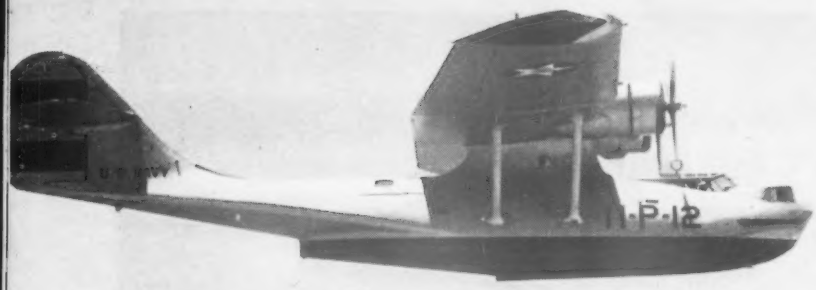
That's great, thinks he. The Tactical School, where practically every officer in the Air Corps wants to go. It would sure make his work easier were he a graduate, like the squadron commander. Lucky dog, the commander. He was go-

(*Continued on page* 81)

LONG SHOTS

THEY can talk about their fancy guns, bomb sights and other gadgets all they want to, but they'll never be able to pass up the camera. While the more or less obvious wartime weapons have been getting publicity, the development of aerial cameras has gone ahead to a degree that demands attention. The two photographs on this page are little more than ordinary examples of modern aerial photography. Among other potent developments has been the perfection and use of infra-red photography. The Army Air Corps picture at the top of this page is an infra-red shot taken at an altitude of 26,000 feet (nearly five miles) over northern Maryland. Washington, D. C., is plainly seen in the foreground. This picture, however, shows portions of Maryland, Virginia, Pennsylvania, Delaware, New Jersey—as well as the *entire* District of Columbia. But, rare though such pictures seem to the casual reader, they are fairly commonplace and in everyday use by military aerial photographers. For war purposes, the value of such photography readily can be seen.

Probably even more important than the cloud-penetrating infra-red photography is the vertical high-altitude photography shown in the picture at the left. Taken by Jack Quiggle of the Aerial Exploration Company of Tulsa, Okla., the photograph shows the heart of Tulsa's business district from an altitude of 28,000 feet (over five miles). The small cluster of buildings in the upper section of the photograph actually contains most of Tulsa's important business buildings. But—to the uninitiated, this picture is nothing more than a high-altitude photograph. To veteran military men, though, that photograph tells them all they could need to know to conduct a detailed bombing raid on that city. Now look again and notice how clearly you can see vital railroads, highways, warehouses and bridges (top left-hand corner).



FLEET

by M. H. CARRINGTON

Thirty-five men died. Thousands of dollars fell into the sea. All because the Navy played a game. Was the slaughter necessary?

NAVAL aviation has been jarred by an unparalleled peacetime scandal. Fatalities to 35 young fliers since August, 1937, bear silent witness to the alleged failure of the high command to coordinate material—in which there has been a tremendous increase during the past year—and personnel. Responsibility for the training program and the issuance of orders for tactical operations have devolved on officers who in many instances cannot perform the duties they require their subordinates to perform.

Such are the sensational charges which have been heard since the tragedy of Fleet Problem 19 shocked the nation.

If there are shortcomings in the administration of the Navy's aviation branch, they were brought into bold relief last March 30 at Hawaii.

The 1938 war games were at their height. Maneuvers as they might occur in actual battle were ordered. Patrol plane squadrons were sent out into the Pacific to search for an imaginary enemy. The elements were at their most vicious—driving rain squalls, crashing, mountainous seas, zero visibility in many areas offshore.

Radio silence was required by the high-ranking officers. This is "war," they exclaimed, and the "enemy" must not realize it is being watched.

The squadrons went out into the Pacific, and found—death.

A few minutes after they took off in

A sister ship of the ill-fated PBY's is shown at the top of the page. Six of these giant bombers were demolished.

Six men died in the crash directly above. Practice landings had been ordered in San Diego harbor in complete darkness.

The arrow points to the remains of the PBY that crashed while flying blind in Hawaii. Note rescue boat hunting bodies.

PROBLEM 19

The five men circled were among the 35 casualties. The photo was made when their squadron, VP-11, ferried their ships from San Diego to Hawaii in April, 1937.

the darkness before dawn of March 30, Lieut. (jg) L. O. Crane and Aviation Cadet W. H. Lear of Patrol Squadron Four, at the controls of their mighty twin-engine long-range PBY flying boat, apparently off their course, sighted a cliff rising from the shores of Oahu.

What occurred in the last harrowing moment of their lives is known only to the Naval board of inquiry which investigated the disaster. And Naval boards of inquiry are not prone to giving wide publicity to their findings.

The plane either struck the cliff, the terrific impact hurtling it into the surf 100 to 200 yards off Kaena Point, or the pilots, in attempting to avoid doom, banked so sharply the bomber was thrown out of control and dived with shattering force into the seething water.

On that same fatal morning, another seaplane, piloted by Lieut. C. E. Signer and Aviation Cadet F. J. Larrobino, of Patrol Squadron Eighteen, disappeared completely, probably only a few miles from the first fatal accident. Because of the radio silence imposed on the craft, no position reports had been received at headquarters on the island. The search for the plane and its occupants was defeated before it began.

There were 11 victims in these two mishaps. Only two of the 13 men in the crews were saved, and these by an astonishing miracle.

The companions of these valiant flyers, the men left behind to carry on, were embittered. From authoritative and reliable sources, from those who were on the scene and witnessed the whole appalling unfolding, step by step, of the incidents which led to the disasters, POPULAR AVIATION is able to present for the first time the story behind the 1938 war games' debacle. It is a story which brings to the fore startling doubts as to the infallability of officers who need not fly planes under any and all conditions, yet are entitled to issue orders that affect the lives of the men who must put them into effect.

Because the threat of punishment continually dangles, like Damocles' sword, over the heads of outspoken junior officers frank in their criticism of the comfortably situated high command, the identity of POPULAR AVIATION'S informants must remain secret.

Three factors contributed to the tragedy of March 30:

1. Pilot fatigue.

2. Miserable weather, in which visibility was nil at times, and the air currents were extremely violent.

3. Radio silence, robbing the aviators of a much-needed navigational aid.

The squadrons of big patrol-bombers had returned to their base late in the afternoon or early in the evening of March 29 after having completed 13 hours of uninterrupted flying under conditions which kept every man of the flight crews under a continual nervous tension.

"Twenty minutes stand-by" was ordered by the officers in charge of operations, officers enjoying the snug comfort of their quarters.

The flight personnel was not allowed to go home. They were told that, because of the emergency nature of the order, they must sleep on bunks on the hangars.

Muscles aching, nerves strained, the aviators, under normal conditions, would have had difficulty finding rest. But there was the "stand-by" order keeping them jumpy, and still worse, the planes were being refuelled and engines tested at the hangars, with all the accompanying bedlam of such activity.

At 2 a. m., the flyers were awakened. At 4 a. m., the planes were in the water and the take-offs accomplished, in the face of what has since been described by veteran Navy men as the worst weather they had ever experienced in the entire history of the war games.

After having flown 13 continuous hours, and having been given an opportunity to regain spent energy in six fitful hours that must have seemed a continuous nightmare, the airmen were ordered to rush to sea on a reconnaissance mission they couldn't possibly have accomplished, anyway, because of the lack of visibility.

But there was little or no grumbling. The Navy's young flyers have courage, but not superhuman strength.

That order on the morning of March 30 was a diabolical setting of the stage for mass suicide.

"Even in actual wartime, operations

Zero visibility, strict flying orders—and the derrick does the rest. At right is the Navy's bloody toll from August, 1937, to March this year.

August 24, 1937—Crash in San Diego harbor, total dead..... 6

January 5, 1938—Bomber disappeared off Southern California coast, total dead..... 7

February 2, 1938—Two bombers collided in mid-air near San Clemente Island, total dead...11

March 30, 1938—Crash off the island of Oahu, total dead..... 5

March 30, 1938—Bomber disappeared off Oahu, total dead... 6

GRIM TOTAL 35

are carried out on a more sensible basis," one of POPULAR AVIATION's informants commented. "Tired troops are relieved, and given a chance to regain their strength completely before being sent back to battle. Planes aren't sent out in murderous weather conditions, when the chances are 100 to 1 that no military objectives will be attained, because of zero visibility.

"And the order to fly in radio silence was exceedingly foolish, even for simulated war conditions, and especially in weather such as had to be encountered. Imagine a big airline dispatching a plane from one of its terminals with orders to grope across country without radio through ceiling zero."

Whatever actually happened to cause the fatal accidents, it cannot be denied that pilot fatigue, with which many of the officers in charge of the Navy's aviation branch cannot possibly be acquainted because of their own limited flying activity, played a major role in this macabre drama.

Certain fundamental principles had apparently not been recognized by those who gave the orders. For example, at sea the helmsman of a ship is not considered an efficient observer and operator after two hours' continuous duty. An auto driver's reactions are slowed to the danger point after seven hours behind the wheel, surveys have shown.

Yet Navy flyers, with multiple responsibilities in their control rooms, are asked to fly 13 hours through weather you could slice, then take off again in similar, if not worse, weather, after only six hours' broken rest!

Actually, it was a miracle that more mishaps did not occur in the 1938 war games, observers agree.

One bomber, forced down at sea off Hawaii due to unfavorable flying conditions, was located by the heavy cruiser *Salt Lake City*, and its crew removed before it sank. Another craft was saved in the surf after hours of desperate work by a Coast Guard vessel.

Three more flying boats, although only a few miles from their base, were landed in the open sea because their pilots preferred to ride the turbulent seas rather than continue to fly through a terrific rain squall.

The scandal of the 1938 war games has reached Congress. Senator Gerald Nye of North Dakota had published in the Congressional Record for May 3 an account of the Navy plane disasters and the possible responsibility of the high command for them.

One of the significant statements contained in this report, which was submitted to Senator Nye by a Honolulu Naval observer, follows:

"A check of the list of the officers in command of naval aviation shows a great majority of them spent most of their years in other branches of the service, chiefly on warships. Officers, many with political pull although never aircraft-trained, get themselves transferred to the air arm to get the extra pay and enjoy the easy assignments.

"Navy aviation monthly payment is time and one-half regular base pay, the extra being risk money.

"Aviation pay is based upon a minimum of four hours monthly in the air. This does not mean four hours at the controls, although it does in theory.

"All today's ranking air officers were trained in the small, slow planes of the years gone by and are not qualified to fly the fast, heavy bombers the Navy is now operating, particularly in gruelling formation flights at night and through storms. Their knowledge of such flying is superficial.

"These officers hand out the orders, assign the bombers (which they cannot fly under all service conditions) to 'simulated war' games, and generally oversee the flying of younger men especially skilled in bomber operation. It would be as logical for a rowboat enthusiast to be given charge of a battleship."

". . . Just some Hollywood writers getting atmosphere . . ."

It is just such a situation that has caused a silent resentment to spread a pall over the ranks of the Navy's junior flying officers today.

As a matter of fact, several airmen have turned in their "wings" within the past few months because they have felt there was no longer any future for them in Naval aviation. They have taken this drastic step only after mature deliberation of the consequences. They are excellent flyers, afraid of nothing. They did not wash out of aviation, sacrificing many years of experience, because of fear.

This is the way they explained it, in effect, to friends at the time:

"Here I've spent 10 or 12 years in aviation, and along comes an officer senior to me, though perhaps only two years out of Pensacola, and he's given a position of responsibility above me. What's the use of my continuing along a blind alley? I'd rather go back on a warship, where experience means something."

The Aircraft Scouting Force is the newest, most spectacular and in many respects the most important division of the service. Only last October were the big patrol bombers comprising this force recognized, in a re-classification of Naval planes and warships, as the first line of craft to contact the enemy in a future war. Known as the Aircraft Base Force until then, this unit was re-designated Aircraft Scouting Force, and all former Scouting Force destroyers —the fastest vessels in the Fleet— were transferred to the Battle Force. Solely on the long-range patrol bombers was the responsibility placed of locating and harrassing the enemy before the main body of the Fleet swung into action.

The consolidated twin-engined ships were supplied to the Navy in prodigious quantities. By the end of this year, the Aircraft Scouting Force will be supplied with more than 250 of the mighty warbirds, each of which can cruise 4,000 miles non-stop. If ever efficient administration was required, it was here. And this is where the adaptation of personnel to material evidently went haywire.

Rear Adm. A. B. Cook, chief of the Bureau of Aeronautics, admitted the shortcoming, when he informed the House Appropriations Committee recently, "We feel now that material has gone far ahead of personnel with these big planes." But lives had to be lost and homes shattered before it finally was realized by the administrators that they were plunging their capable flyers pell-mell to destruction by asking too much of them.

The history of the Aircraft Scouting Force has been a mixture of triumphs and disasters. The Navy is proud of the fact that it has delivered 42 bombing planes in three non-stop mass flights from San Diego to Honolulu, and 26 more in two flights from San Diego to the Canal Zone. The greatest of precautions were taken before the planes were allowed to leave the water. Weather charts were studied days in advance. Careful mapping of the routes was accomplished. Radio equipment was tuned to perfection, so that the flyers could keep in constant touch with their bases and with the other planes. The flights were accomplished without even a minor casualty, because they were well planned, well executed.

Exactly the opposite precedure prevailed at Hawaii, merely because a mock war was being fought. All the rules of safety were disregarded by the high

(Continued on page 72)

The Glendale establishment consists of a hangar, a shop, the general offices and a stock room. The combined inventory shows 32 airplanes carried in stock and 200 additional ships listed for sale.

SECOND-HAND WINGS

by WILLIAM B. RYAN

If the fate of used airplanes has intrigued you, Charley Babb can tell you more about where they go than anyone.

Left to right are Babb, R. M. Ressler and Al Phelan, used-airplane experts.

IN 1930, one year after the greatest financial holocaust of all struck our fair land, aviation wasn't such a spry business. In fact, things were bad, and as 1930 wore itself out and became 1931, the most pessimistic expert was astounded to find that the latter year was even worse than the former. The thin line of daring aeronauts who crouched around hangar stoves from Bangor to Seattle were, for the most part, selling ties for a living.

Oddly enough, Charles H. Babb, head of what is now the largest used-airplane export company in the world, chose that forsaken stretch of gloomy months to start his business.

People like to think of Charley Babb as one of the game's real Alger book heroes. They like to tell, as they squat under some muddied wing, that here was a down-and-outer who pulled himself up by a pair of frazzled bootstraps, and in less than eight years became one of the air's great men. This is romantic enough, but it is not strictly true. Babb, a California native son, had been prospering fairly well in the aviation game for ten years before he decided to open his own company. The Southern California chapter of the N. A. A. owes its beginning to his efforts. He promoted one of the West's first and best air shows—at Clover field—to celebrate the famed Douglas "First Around the World" flight. He flew, bought and sold airplanes along with the best of them until 1929. Then, when the depression gave aviation's flimsy financial shorings a deft jerk, Charley jumped nimbly out of the way and started cutting a path through the wreckage.

Outwardly, things were not ripe for a start in the used airplane business. Just about every airplane in the United States was for sale at a bargain, and the supply exceeded the demand by a good number of hundreds. But Babb knew a lot about used airplanes, and didn't have to be told that they were not always what they should be. And he knew that the people he would want to be his customers also possessed this information.

According to the laws of the land at that time, a licensed airplane theoretically never got more than 300 hours old after which time it was rather miraculously renewed, either by the sweat of some mechanic's brow, or by neat, inspired penmanship in the log books. Buyers, on account of the prevalence of this latter method, were leery of anything with wings. Therefore, reasoned Charley, if he could overcome the national aeronautical fear of getting hooked, he could sell airplanes no matter how bad conditions got.

He rented a hangar at Dycer airport in Los Angeles, took in a few used airplanes, rebuilt them completely, and, to the surprise of the aeronautical fraternity for miles around, had little trouble selling them. After a year of this kind of operation, the news began to leak out that there was a guy in California who sold and *guaranteed* reconditioned airplanes. Of course, the guarantee part baffled most airplane buyers, since the idea had always been to sell the airplane and let the taker worry about it. But regardless of what people thought, another rumor leaked out, shortly, that

Boeing 40-B's, once the pride of United Air Lines, train students in Honduras and Peru. Babb (right) is shown below with Commander Romano, Peruvian air force official.

Babb actually did make good on his guarantees.

Fortunately for Charley, he wasted no time scotching counter-rumors that all this was not true. Instead, he hustled over to Grand Central Air Terminal one day and sold an odd-looking airplane to one Francisco Sarabia, head of Transportes Aereos de Chiapas. Automatically, he became an airplane exporter. The ship was a single-engined Emsco, eight place, of a design that somehow failed to click in this country. It was built to carry one, two or three engines, looked rather peculiar to an eye that had grown up on Fords and Lockheeds, but was otherwise good. Transportes Aereos is still using it, along with some 30 other ships and about 100 engines that they have bought from Babb since that day.

Sarabia, patently, was pleased and the sale gave Charley the big idea that has enabled him to build into something really large. He realized that there were hundreds of good airplanes in this country that were standing idle, eating up hangar rent, simply because no one had any use for them. They were not properly designed for American service. But like the Emsco, they would be worth their weight in pesos once they crossed the Rio Grande.

So he abandoned his policy of just buying good airplanes hopefully as they came along, and began a systematic inquiry into conditions to the south. There were gold mines, lumber camps, isolated cities and towns there which all could support certain types of ships. There were ways to use airplanes that would be unheard of in the United States. Charley put this information to work, and his efforts were unquestionably the start of commercial aviation in Central and South America. For practically every airplane in that part of the world, if it does not belong to Pan American Airways or one of the German interests, is there because Charley Babb investigated the needs of its owners, then furnished it to meet these needs.

Sometimes, when a particularly tough flying job is specified, he had to use a lot of imagination. There was the case of the lumber company that wanted to haul heavy mahogany logs out of impenetrable jungle. Logs, so far as airplanes are concerned, are not only heavy —they are almost impossible to handle. But there was money to be made in such a haul, and the prospective buyer asked him to do what he could.

So it is that now, out of that very jungle, airplanes are hauling logs. Just the airplanes for the work, too. Charley found out the weight of the logs, the operating altitude, the size of the fields, rummaged through a file of possible ships, then wired Cleveland. The result was that the Great Lakes torpedo planes (POPULAR AVIATION, March, 1938), which somehow had not been sold to the Navy, were sent to Central America instead.

Out of other jungles, stout hearted Ford tri-motors, elbowed off United States airlines by the DC-2, soar majestically, and over Andean peaks, and into handkerchief-sized fields where no modern transport would ever dare go. Boeing 40-B's, onetime pride of United Air Lines, train student officers in Honduras and Peru. Dainty Lockheed *Vegas* snore out of mile-high fields in Mexico. Travel Air 6000's nose into places that all the world, outside of their owners and Charley Babb, has forgotten. They're all there because Babb sent them.

Most of his customers in the South do not bother to see what kind of an airplane they want. Babb has shown them, so many times, that his guess is better. When they find a place where some flying should be done, they merely wire Charley, telling him the size and altitude of the fields, the length of the haul, weight of the loads and, sometimes, the maximum permissible operating cost. When the wire comes to the Glendale office, Al Phelan, who has been with the company since it started, climbs into his car and goes out to look over a dozen or so airplanes that might fill the bill. If he finds one that will do the work, he buys it and flies it back to Glendale, where it is completely rebuilt. As soon as it is finished, the buyer either sends a pilot for it, or a Babb pilot flies it to its new home.

SOME BABB DO'S AND DON'TS FOR USED AIRPLANE BUYERS

1. Remember, first of all, that the best airplane is no good if you yourself have no use for it. Check your requirements carefully, then see if the ships available are adapted to your needs. Buy the one that suits these needs best, regardless of your personal prejudices for or against any one type of plane.

2. Make sure that the airplane you buy is as represented. Have a licensed mechanic check it over from prop to rudder. An airplane that has been properly maintained will be in good shape.

3. Check log-books carefully, or have someone check them for you.

4. Don't be carried away with the idea of having "something to fly." Make sure that the airplane you buy is something more than that. Otherwise, you may go sour on flying and miss out on a lot of fun.

The chances are that the buyer will not even see the airplane until it is delivered. To him, it will be something like a Christmas present from a favorite aunt, for while he knows that it will be good, he hasn't the slightest idea what it will be. Babb guarantees that the ship which he delivers will do the work.

Export business comes into the Babb office automatically, so charmed are our Latin cousins by his business record with them. With them, he has no sales problem; only one of supplying their wants properly. To take care of them a little more efficiently, he moved his headquarters from Dycers to Grand Central Air Terminal in 1934. Most business men from the South came in there anyhow, and he thought it quite a nuisance to have to go all the way across town to see them. Last year, he opened an Eastern branch at Floyd Bennett Field, New York, to take care of business on that side of both northern and southern continents.

Babb's own office is a room much larger than such places usually are. As you enter, you walk, clump, clump, clump, across the concrete, carpeted floor, to his glass-topped desk, which is usually covered with the telegrams which seem to be the life of his business. He is one of the busiest men in the game, and if you are trying to get a story from him, you can count on being interrupted several times before you are through. During these little intermissions, you can see that the office must be large to accommodate all the things he keeps in it.

There are pictures. There is a large oil painting of a Fokker F-32. There are swords, machetes, canes from Mexico, and across a large chair is draped a blue and white robe from South America, into which "Charles H. Babb" has been woven. There are autographed pictures of presidents side by side with autographed pictures of Peruvian army officers. To one who has never been there before, the office is definitely among those unusual, other-worldly places which he unconsciously associates with fabulously interesting people.

Babb, as he talks to you, impresses you as a man who knows what he is doing and what he is saying. If the phone rings, and he goes into a confab with someone about a ship that might be in Wenatchee, Washington, you will discover that he knows, besides its horsepower and adaptability, just as much about the airplane as its present owner does. Sometimes he knows more. He knows, if a log-book is lost, whether the engine in the ship is the original, just by looking at the number on it. He can tell you the case histories of a thousand ships—though he probably won't.

Babb spends more time doing than talking. Very few people know what is going on inside the Charles H. Babb company. In a business as competitive as his, he reasons that everyone's business is no one's business, and keeps his mouth closed—tight. The people who buy ships from him know that he's always treated them properly and are satisfied. But paradoxically, while Babb's customers seldom bother to investigate him, his company has to keep a close watch on them—and not for any credit reasons, either. Some years ago, a State Department ruling made the sale of airplanes which are to be used in warfare a very risky thing. Babb doesn't go for risky things. His firm holds one of the first export licenses to be issued by the State Department for export of used aircraft, and they are considered implements of war.

The rub is that it's Babb's responsibility to see that none of the airplanes, engines or other parts which he might ship to some country are ever used in warfare. If one of his customers, at any time, decides to resell a Babb airplane to Spain or China, Babb is out of luck as far as the State Department is concerned. So he has to be very careful in selecting new customers below the Rio Grande.

The export license, mainly due to the

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SPY!

by KURT RAND

American aviation has been the target of foreign spies, government agents recently found. Herewith an exclusive inside article.

G-man L. G. Turrou (right) led the recent spy cleanup that netted the three Germans above. Left to right are G. G. Rumrich, O. H. Voss and Erich Glaser.

A GRIM story of foreign espionage, much of it directed against American aircraft factories engaged in the production of secret military airplanes, engines and equipment and against our air defense system, is being told to a startled American public in our courts.

For one story which has been dragged into the open, however, there are others, possibly even more sinister, which are known so far only to the counter-espionage agents of the four great American anti-spy agencies—the Federal Bureau of Investigation, the Army G-2, the Office of Naval Intelligence and the special agents of the State Department.

With the lifting of the curtain in New York on one of the most extensive spy rings ever discovered in this country, Americans have been given a glimpse into a strange sea of international intrigue. Strange, because it is so new to this nation, long-sheltered from that type of espionage which is an ancient and accepted fact in Europe.

Above are Senta De Wanger (left) and Johanna Rofman, both held as suspects.

The shadow of the spy is on the land, darker and more menacing than at any time in our history with the possible exception of those days just before our entry into the World War, when German spies and saboteurs filled the land.

It is the opinion of those officials in Washington who will discuss espionage at all that most foreign powers—and a majority of them are implicated to some extent—spy on the United States not so much as a potential enemy, but as a source of new developments in the military science. In other words, they want the information not for possible use against this country but for use against enemies or potential enemies much closer at hand.

These foreign agents are in the market particularly for aviation developments and the revelations in New York and elsewhere indicate that they regard as prime prizes any authentic information of new military airplanes, especially of the long-range, high-speed types; of airplane carrier design and operating methods, of new high-powered aircraft engines, and of new instruments, especially the bomb-sights which have so tremendously increased the effective altitude of American Army bombardment airplanes.

To the average American, the thought of foreign spies is something of a joke. The joke is less funny, perhaps, since the days of 1916 and 1917, when ship and factory fires culminated in the famous Black Tom and Kingsland explosions in New Jersey, both attributed to German saboteurs. Nevertheless, the American man on the streets is not inclined to take "spy business" too seriously.

More than the New York case, following in the wake of a Federal grand jury indictment of 18 persons, headed by high German officials, apparently is necessary to arouse an habitually peaceful American nation to the menace within its doors.

Whether this additional proof will be given publicity depends upon the activities during the coming weeks and months of the agents of the four executive departments of our national government who now have joined forces to

Harlem Negroes staged this anti-Nazi parade in New York City following the victory of Louis over Schmeling recently. The placards urged the ousting of Hitler spies.

This store near potent Mitchel Field was a target of spy-hunting federal agents.

protect against the foreign spy the details of a new defense program of the order of $3,000,000,000.

There is clear evidence that, even if the man-on-the-street is not yet thoroughly aroused, the Federal Government is alert and active. The spy menace is not discounted in Washington.

The heaviest counter-espionage burden falls upon the G-men of the Federal Bureau of Investigation, who "broke" the New York case. It is the job of the FBI to investigate espionage in all its ramifications. The Army and Navy, for lack of funds from a Congress which —like the average citizen—is inclined to make light of espionage, are not able to undertake extensive counter-spy work. Army G-2, nevertheless, is doing what it can to protect the secrets of its new equipment, defenses and tactics. New airplanes are jealously guarded and visitors' privileges have been curtailed at important flying fields. Double precautions are being taken at aircraft factories in which Army airplanes are under development or construction. The Office of Naval Intelligence functions similarly to protect Naval secrets. Shipyards and air stations ashore are much more carefully guarded and naval personnel itself has felt the gag. State Department agents so far are chiefly concerned with checking against passport frauds and so making more difficult the way of the foreign undercover agent.

Aviation espionage, aside from that in the aircraft factories and at fields where new and experimental types of military airplanes are customarily to be found, apparently is concentrated at the Panama Canal. The canal, obviously, is an outstanding potential target in case of warfare between the United States and either Pacific or Atlantic powers. Foreign agents have been especially active in seeking information as to defensive aircraft and anti-aircraft protection of the Canal Zone and are known to have given considerable attention to plans for the location in Central America of a base or bases for bombardment airplanes to be used against the canal.

Within the United States itself there have been several publicly-known cases of foreign espionage directed at aviation centers. In 1932 two Army privates were imprisoned on charges of stealing and selling Army Air Corps photographs and other military data. Four years later there were two arrests within a month—those of Harry T. Thompson, former Naval petty officer, who was sentenced to 15 years in jail for posing in Naval uniform to get information off ships in California ports; and John S. Farnsworth, Annapolis graduate, who was sentenced to from 4 to 12 years in jail for selling Naval secrets. In both these cases, supposed Japanese agents were involved.

A blonde German girl, a former American Army officer and a soldier stationed at Mitchel Field, N. Y. (obviously a vital Army air center) were arrested last February on suspicion of a plot to sell military secrets to a former power.

The recent difficulties at the Douglas plant in Santa Monica, Cal., although attributable to labor difficulties, were not without their international implications. Communists were rather heavily involved, Washington has been informed, and Soviet Russia is charged with more widespread spying activities and propagandizing in the United States than any of the powers which are labelled as "Fascist."

The Japanese government is credited with having spent something like $15,000,000 a year in espionage activities prior to the outbreak of its undeclared Chinese war, and since that time its expenditures unquestionably have been considerably increased. The most important aviation information known to have gone to reputed Japanese agents had to do with trials of the *U. S. S. Ranger*, aircraft carrier. Disclosure that secret reports on this new carrier had been sold grew out of the Farnsworth case.

Officers of the Army and the Navy have become seriously alarmed over the growth of foreign spy activities as a result of our increased armament programs. Both Army G-2 and "O.N.I." have gone on what virtually is a war basis, so far as has been possible with limited funds available for the purpose.

The general tightening up is evidenced in many ways which even the layman may observe. The War and Navy Departments are full of signs prohibiting entry into parts of the buildings. There are new safes for the filing of the more important secret documents and drawings. Officers who travel by train carrying confidential papers are required to use staterooms which can be locked and to see that they are kept locked while not occupied or under observation.

President Roosevelt recently signed a new law forbidding photographing or sketching, especially from the air, of details of 24 military and Naval reservations in the United States, in the Aleutian Islands, in the Panama Canal Zone, Hawaii and other possessions. The Army and Navy themselves have restricted the photographing of such places by service personnel from military aircraft and it is difficult for newspapers and other publications to obtain even censored photographs of these reservations and it is becoming more difficult to obtain photographs of new airplanes and equipment during the experimental period.

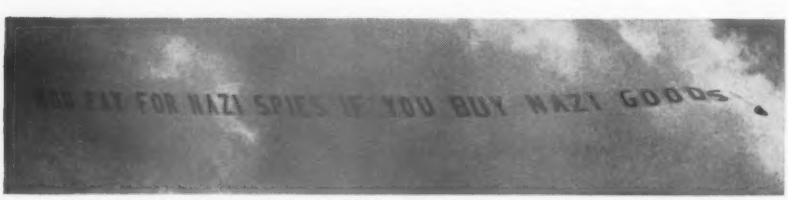
This procedure is followed, not so much from the desire to prevent American publications using harmless photographs which do not disclose vital secrets as to "smoke out" foreign governments desiring such information and to lead them into possible actions coming within the scope of our own anti-espionage agencies.

It is admitted, however, that there are serious loopholes in the screen Uncle Sam has sought to erect for the protection of his military plans and equipment. Espionage laws of the United States provide penalties ranging from two to 20 years in prison for "unlawfully obtaining or permitting to be obtained information affecting the national defense" or for "unlawfully disclosing information affecting national defense" or conspiring to obtain and disclose information. Fines up to $10,000 are provided in addition for these crimes and for harboring and concealing violators or obstructing justice. These laws were passed during wartime and for the past 20 years it has been admitted they have serious faults and efforts are being made to strengthen them.

To obtain any official comment on the spy cases in Washington is a virtual impossibility. The Federal Bureau of Investigation, aside from the New York case which has been "broken", will scarcely even admit that other counter-espionage activities are under way. The chief reason for the absolute secrecy which prevails is, of course, to prevent alarming additional suspects, who are growing exceedingly wary as Federal vigilance increases and public indignation mounts.

An example of the care with which the FBI is guarding its activities was the prompt suppression of what was to have been the "inside story" of the New York and other spy cases by former Special Agent Leon G. Turrou. Turrou, one of

(*Continued on page* 70)



As a result of the recent aviation spy case, an anti-Nazi organization hired two airplanes to fly signs like these over crowded New Jersey and Long Island beaches.

Army test pilots have been flying this Curtiss P-36 with its novel twin props.

TORQUE CURE

SOME time ago POPULAR AVIATION, in "The Man Under the Hood," told of secret tests being conducted at Wright Field by the Army Air Corps on a fighter equipped with two propellers, each turning in the opposite direction. Recently, the Air Corps officially bore out that exclusive item with the photograph at the top of the page. Wright Field officers at the same time announced the successful completion of tests on the unusual device. Whether the Air Corps ever will be equipped with ships using this principle is something POPULAR AVIATION'S informants would not say.

Oppositely rotating propellers are not new. Successful use of them is, however, comparatively new. The world's airplane (and anything else, too) speed record is held by a plane using that principle. Early experiments on the twin props, however, date back to 1917. The principle works best at high speeds. It is intended, then, to be used to increase the performance of the Army's single-seater fighting ships. Main benefits of the device are the almost-entire elimination of engine torque (extremely important on tiny, powerful fighters) and the reduction of propeller diameter for equal power, all without efficiency loss at high speeds. Naturally, this will make for better designs in the future.

Frederick Koolhoven, prominent Holland manufacturer, is experimenting with his version (above) of oppositely rotating propellers. This novel machine has not yet flown.

The principle of twin propellers was proved conclusively in 1934 when Francesco Agello, Italian airman, flew the Macchi seaplane (below) 440 m.p.h., the present record.

We don't fly for LOVE

On April 1, 1938, just 314 stewardesses were employed by five airlines. Of these, 110 resigned in 1937, 98 to be married. Average salary is $121.87 per month, average years in service: 1.6.

by JEANETTE LEA

This surprisingly frank, exclusive article was written for POPULAR AVIATION by a stewardess. It answers many questions about these famed girls.

BECAUSE my emotions and sentiments are much the same as girls who fly on one of the five United States airlines employing stewardesses, I'm becoming rather peeved with all these printed insinuations that pop up in newspapers and magazines, hinting that those of us who fly on airliners go in for this work purely in the quest for love and romance. Just because a third of the hostesses and stewardesses resign during a single year to be married does not mean that all of us sit up on a perch in the sky waiting for Dan Cupid to soar by and take a pot shot at us with his "poison" arrow.

As I sit down behind this typewriter (slightly out of tune and the one that I used, incidentally, to write letters home while in a nurses' training school) to write a few words in defense of the 314 girls who earn their bread and butter as stewardesses, I am scanning a few figures that might be interesting. These statistics are authentic, having been furnished by heads of American Airlines, Braniff Airways, TWA, United Air Lines and Western Air Express. As perhaps readers of POPULAR AVIATION know, only two other lines—Eastern Air Lines and Pan American Airways—have cabin attendants. They are male stewards. Our discussion will concern only the girls, as we are assuming that none of these young, personable male stewards are merely serving their employers while waiting for Miss Millionbucks to come along and lift them from the sky to the ethereal bliss of rich, gigiloish matrimony.

First of all, let's get a cross-section of this stewardess business by learning that on April 1, 1938, only 314 stewardesses were employed by the five lines. That is just 30 more than were employed the same time last year, the increase being due principally to increased schedules. Even so, the news that there are only 314 available positions for stewardesses on U. S. planes is not very heartening to the young, energetic and ambitious miss who is ripe out of school and who seeks this type of employment—whether it be in search of love or work. There are thousands of thrill-crazy kids who each year pepper the airlines for stewardess work. Most of the letters these girls write are promptly filed in the wastebasket by four of the lines, because they are not registered nurses. These non-nurses are girls who are fresh out of high school and who are feeling the urge for unbridled adventure and travel for the first time. So highly publicized has Miss Air Hostess been that there is naturally attached to our work an aroma of romance.

What is the turnover amongst air stewardesses? Well, out of the 314 gals on the payrolls (averaging $121.87 per month) as this is written, 110 resigned in 1937. Ninety-eight of these girls resigned to be married and 12 resigned for various reasons such as ill health, illness in the family or to accept ground positions for higher salaries. Incredible as it may seem, the average stewardess spends only 1.6 years in the service before resigning. Some of the younger, flightier ones serve as little as four or five months before hauling off to be married. Their brief careers, however, are offset by long, faithful service on the part of veteran stewardesses who have already flown for five or six years and in-

The paraphernalia here is ample evidence that a stewardess has plenty to do aloft.

Stewardess Mae Wood of United Air Lines is one air-girl who believes in exercise.

Braniff Airways demands Spanish-speaking girls (left) instead of nurses.

United's Sue Nelson (right) proves that beauty in the air is not at all missing.

tend to keep on flying until their usefulness to the company dims.

In my own case I have been with one of the Big Three airlines (*Editor's note: American, TWA and United are called the Big Three*) for a little more than a year and I intend to be a stewardess for at least another two years. Marriage is not a prime consideration in my life at this point, though I am a normal, healthy lass who is going to observe her 24th birthday in a very few weeks. I wouldn't be normal, however, if I didn't have the thought in the back of my mind that some day I'd be camped in a home of my own with a loving, respected husband and with possibly an offspring or two.

But I certainly didn't take up this work in the pursuit of love. Some of the old school occasionally suggest that a stewardess is just a nurse who couldn't find her love life on the ground, so she took to stewardessing. This school of thought is outrageous, as perhaps you could best understand if you knew a stewardess or two. We regard ourselves as regular business women who devote 88.75 hours (on an average) a month in the air. We do our work sincerely and efficiently and do our very best to promote the interests of the company. At the end of a trip we hang up our uniform and relax much the same way as any American girl does. There are letters to be written now and then to dear friends and close relatives. There's a good book that a room-mate has just bought that we must read. Perhaps a pilot or a co-pilot from another airline has suggested a movie or a few sets of tennis. Perhaps a passenger agent or a traffic man will drop by to split a bottle of beer or a highball.

Be sure to get this point. Most of our leisure time is spent with those with whom we associate in work—but not passengers. Do the passengers try to date us? Certainly. Don't some traveling men always try to date the hotel telephone operator, the public stenographer, the hat-check girl or the chorine when they are out of town? Once in a blue moon one of us will marry some man whom we met on shipboard. But this one-in-a-thousand marriage has blossomed from a chance meeting to a sincere friendship and into a deep love before being consummated in wedlock. The other 999 passengers who seek dates are the "masher" type who suggest coming to their hotel for a few drinks.

Every single airline that has stewardesses is strong in the defense of its girls. We were not put on the airplanes eight years ago to act as taxi dance hostesses. We would serve the company in a low, disgusting way if we sought out a date from every amorous male passenger. Fortunately, most of our passengers are high-type men who recognize us as professional young women rather than anything else. We have a certain nice way to discourage the objectionable "air vamp." Naturally he is a patron of the company we serve and must not hurt his feelings to a degree where he will turn his patronage to another line. We can always explain, however, that our "heart interest" is waiting for us at the

Airline stewardess and hostesses have plenty to keep them busy on scheduled flights. Below is a "chair car" cabin of a giant Douglas airliner.

Hostesses fall back on their training as nurses in helping care for babies traveling their line.

next terminal, that we have a previous engagement or that we have to stay with a sick aunt.

No, dear readers, stewardesses are not "hard up" for dates, nor do they go into the service for love. Some folks venture that perhaps our work is nerve-jangling and has a bit of danger and, for that reason, we are eager to get out of it and get married. Wrong again. Mind you, we are registered nurses whose previous work has been around sickness and disease. How much more dangerous and self-sacrificing is *that* work than to be dressed in a snappy uniform and travel around in luxurious transports at 200 m.p.h. and get paid for it? In the hospital we were always in danger of being infected from one of a hundred dread diseases. We had to be constantly on guard against contagious maladies and inoculated against them at frequent intervals.

None of that in this job. As my boss explained when I was hired, "Miss Lee, we are not hiring you just because you are a registered nurse. Instead, we have found that institutionally trained girls can deal with the public much better."

All right, you say, but why do stewardesses average less than two years in service? There you have a point well taken. It's a question I can't answer from experience. Perhaps some little gal who is neatly settled in her home awaiting the first child can tell you why she gave up her wings for domestic happiness. Some of the girls whom I know as competent stewardesses are married and still are flying. It's no problem to be married and keep it secret. This is June and I know one stewardess who was married in March and no one is yet the wiser. Another line doesn't give a hang if its girls are married. Take the case of a dear friend of mine who married a swell fellow 700 miles from her home station and stuck it out a year before quitting to raise a family for him.

All of this banter brings us down to the point of how do stewardesses stack up when pitted against the morals of the average girl. In uniform we represent the highest type of womanhood. Being perfectly loyal to the company, we neither smoke nor imbibe in uniform. Out of uniform we are just perfectly human. Like most girls a large percentage of us will smoke a cigarette. Those of us who smoke do it because we enjoy it.

Most airlines have stiff regulations stating that its stewardesses or hostesses shall do no drinking within 12 hours of the time she reports at the airport to take a trip out. Obviously, the company doesn't send escorts with us day in and day out to check up on our behavior, so occasionally this regulation is abused by the "smarties" of the profession. I've seen girls seated comfortably at a bar, sipping a Tom Collins or a beer two hours before shoving off for the airport. That, fortunately, is not the rule. And I've seen girls pour a few drinks into their tummies an hour after arriving from a trip—just long enough to get up to the hotel room and change the uniform. In fact, I've been guilty of that myself once in a while. In this modern age, I see no reason to hide behind fences or in dark alleys to take your fun. I enjoy a drink once in a while—very few professional girls don't. But it's always done *out of uniform* and out of character and does no one any harm.

How about love and romance? Why not? This is a matter of fact discussion about air stewardesses, but it is not intended to be an exposé of any particular heart. I overheard a conversation between two of my passengers the other afternoon. One of them said, "I wonder why the airlines select registered nurses for its stewardesses. I never regarded a nurse very high morally." I could have slapped his face to express my feelings, but how much easier to ignore the remark. Here again, he was dead wrong. I've known a lot of nurses and I've known a lot of professional women and office girls. I'd bet a nurse or a stewardess against an office girl any time.

There are sometimes enough black sheep in any profession to give the whole group a slap in the face. This may be true of nursing—but I don't believe it. It may be true of stewardessing—I don't believe that either. I've seen stewardesses doing their regular work in flight who thought nothing of getting a little extra close to an occasional male passenger to answer a question or adjust a ventilator. Perhaps she was attractive enough or close enough to impress this passenger a bit. But certainly she did not give him any encouragement. At least not enough to extract an invitation to visit his hotel room for a few drinks or more.

The most bothersome passenger is the Joe who steps aboard a ship in a perfectly sober condition and, while you are busy in the rear of the cabin preparing a meal or something, sneaks himself a drink or two from the pocket. You usually spot this type of passenger and gently but firmly relieve him of his bottle, or extract a promise of "no more drinking, teacher." We don't do this in a prudish way, either. But when 12 or 15 or more self-respecting passengers are aboard the ship, we certainly don't want one inebriate spoiling the trip for everyone.

Two or three nights ago I had one of these smart Alecs get on. First he wanted some soda water to mix his drink with. I explained that we didn't permit drinking. After an hour or so he had sneaked in three or four quickies and he became obsessed with the thought that I must be his soulmate. His familiarity as well as is conversation was disgusting. He was an obnoxious looking person, with or without his liquor. I'm a congenial person and easy to get along with, but this fellow was impossible. I stood it as long as I could, then I told the pilot about his actions. In concise language the skipper explained to this passenger that the stewardess was not an outlet for his emotions and if he felt that he just had to "play around" that he'd better wait till he got on the ground.

In painting this picture of a stewardess I hope I'm avoiding any thought that I'm the schoolteacher, old-maid type of stewardess. If I haven't, get over that idea right away. Naturally—I'd rather have someone else describe me. I'm a brunette—in fact, 200 of the country's stewardesses are brunettes—and my hair is quite lovely if I do say so myself (*Editor's note: Miss Lee isn't exaggerating. In addition to the 200 brunettes, there are 98 blondes and 17 redheads in the stewardessing business.*) I have brown eyes. I'm proud of my teeth, mostly 'cause I take good care of them. My figure is good and I keep it that way with a lot of exercise—bicycling is my favorite sport and I go in once in a while for horseback riding.

When I'm in town you can usually find me in my apartment, one that I share with two other stewardesses. They are a lot of fun to be with in spare moments, and between us we have a lot of friends and acquaintances who drop in occasionally. Not far distant from our place is a hotel where many other stewardesses and flying personnel live. Once in a while we drop by on these flying friends for a round of beer or just a good old-fashioned bull session.

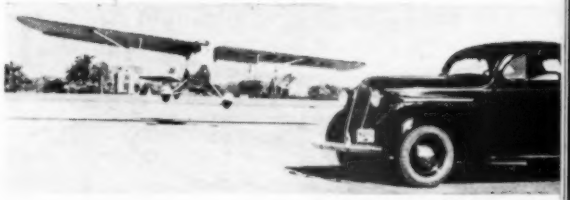
Romance will flair up once in a while, too. It'd be a sad life for an attractive girl if it didn't. Lord knows, romance won't flair for me 30 years from now. Sure, I've been kissed and have liked it, too. Deep down in her heart, every girl

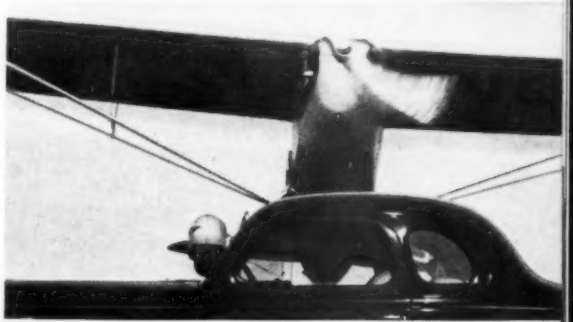
(*Continued on page* 80)

THEY **WILL** TAKE CHANCES . . . .

IT IS flying like that you see on this page that results in scenes like that directly below. It is this kind of flying that is guaranteed to give aviation the kind of a black eye that raw beefsteak can't cure.

The picture at the top of this page came close to being one of a serious accident. The "excuse" was an air meet at Philadelphia in which pilots were to use the parked automobile shown in the picture as a pylon. The pilot of the big Stinson above had misjudged his distance from the car and, as the camera shutter clicked, the girls had started to duck to the car's floor. The plane's wing sliced through the air where the girl on the right stands just a split second later. Had the pilot hit the girl, and his ship crashed, the airplane manufacturer as well as private flying would have suffered—needlessly. Likewise, had the pilot at the right slipped in the slightest, the *Cub* would have plowed through the car and undoubtedly killed the pilot (no one was in the car). All this for what? The picture below is one answer. That pilot was stunting a standard sport plane close to the ground. He missed—and they buried him soon after.





FLYINGS

Major-General Mason M. Patrick (left) ruled his Army Air Service with an iron hand.

by JAMES FARBER

Every general in the Army Air Corps is a flying man and has as little to do as possible with swivel chairs. Here is your opportunity to get acquainted with the Army's "brass hats with wings".

Brigadier-General A. W. Robins (left) decorates Lieutenant B. S. Kelsey for bravery.

THERE are no swivel-chair generals in the Air Corps!

Today, every one of the commanders of the United States Army flying service who have been anointed by the Powers-That-Be and who wear either the single silver star of the rank of Brigadier General or the two silver stars of the Major General on his shoulder straps, is a qualified pilot.

There are 13 of these men in command of Air Corps troops, stations, departments and divisions. Two of them —Major-General Oscar Westover, chief, and Major-General Frank M. Andrews, commander of the now-famous General Headquarters Air Force — wear two stars. Every one of America's "Flying Brass Hats", to employ Army argot, is a hard-flying, hard-shooting officer.

Probably the hardest-flying of them all is their chief whose flying exploits are a by-word in the corps and who follows and equals the record set by his predecessor, Major-General Benjamin (Benny) Foulois, now retired.

Time was, however, when—far from being the bright and shining example of leadership for the other arms of the service to emulate—the Air Corps was under so many handicaps that it was actually regarded as one of the underdogs of the United States military service. Promotion was slow. The corps was under-manned and under-planed. And to make matters still worse, there was the bitter rivalry and slug-fest tactics of the U. S. Navy that were warned about by Billy Mitchell (and delineated in POPULAR AVIATION recently).

To be in the Air Corps in those days was a discouraging proposition. Officers stayed in their rank for years while officers of other arms rose to the higher pinnacles of military rank and fame. For a long while there were only two generals in the entire Air Corps from Governor's Island to Luke Field. What chance, then, did a man have of obtaining his captaincy, to say nothing of his majority or even higher? Brother officers in the Infantry and Cavalry and other arms and branches were forging ahead and becoming captains and majors and colonels and then achieving the coveted silver star.

It looked pretty bad and it was bad. But today these 13 generals who run the Army's aeronautics are the result of an arresting saga of the military service. Into this saga is woven the tradition of fighting men, their own Army politics, their struggles with civilian politicians and, most encouraging of all, the tremendous changes wrought by time itself in the last few years.

So let's have a close look at these Lucky Thirteen, if you want to call them that, and see what the story is back of their promotion to the top of the heap. We'll see, then, just what it means to be a General in the United States Army Air Corps.

In the beginning there were, successively, three flying Generals. And that beginning was back in the dark days of what has been called the dress rehearsal for the next attempt to annihilate the world: the World War. Number

Brigadier-General William E. Gillmore is retired and lives in San Francisco.

G STARS

Brigadier-General Henry H. Arnold is one of the Army Air Corps oldest and best airmen. At present, he is in Washington as assistant Air Corps chief under Westover.

One of these three was "Benny" Foulois, who was chief of the air service, as it was called then, from early in 1917 to May, 1918. While the ubiquitous Benny was flying through Archie bursts on the Western Front, his dashing young assistant, Billy Mitchell, was acquiring his own reputation as a flying brass hat. Then Benny came back to America and was succeeded by General Mason M. Patrick, who served from May, 1918, to July, 1919, as air service chief. Billy Mitchell was promoted to the rank of Brigadier-General and thus the flying triumvirate of Brass Hats was completed.

Right here was a study in strange contrasts: Billy Mitchell was young, hot-headed, fiery-tongued, outspoken, strictly an officer of the *new* school of army thought. Yes, and of Army politics. His chief, General Patrick, belonged to the stern old school that ruled the service with an iron hand even though Patrick, personally, as any Air Corps Officer who knew him could tell you today, was no martinet. On the contrary, he was popular and was able to bring excellent discipline into his command. An older man than either Foulois or Mitchell (he graduated from West Point with the class of 1886), he was nevertheless a hard-flying officer. And the study in contrasts was further accentuated in the person of Benny Foulois who was a scrapper and who balanced his Connecticut conservatism with a tremendous desire to advance the interests of the service against tough going with civilian politicos.

Benny, it might be remarked, was lucky in one particular. A Republican, he was aided no little by the succession of G. O. P. presidents that continued until the election of Mr. Roosevelt.

Affairs were in somewhat disordered shape right after the war. To keep things going, a director was appointed to run the Air Corps. Named to the job was Major-General Charles T. Menoher, a West Point classmate of General Patrick. Menoher was a distinguished artillerist, rose from the command of the Fifth Field Artillery to commanding general of the famous Rainbow (42nd) Division. He was not a pilot but was regarded as a first rate man for the job. He continued as director of the Air Corps from January, 1919, to July, 1920, at which time his title was changed to Chief and he served in this capacity until October, 1921. He was the only General ever appointed to the corps who was not a pilot

General Patrick resumed control of the Army pilots. In 1925 he was reappointed and he kept right at his side the ubiquitous Benny Foulois. Then, on his 64th birthday, December 13, 1927, a hard-flying pilot to the last minute, he retired, with 31 years of Army life behind him.

But Patrick and Foulois, aided unofficially and very informally by the cries of the prophet in the wilderness of Army and Congressional politics, Billy Mitchell, whose military troubles and their attend-

Major-General Oscar Westover is present Chief of the Air Corps and a crack flyer.

Major-Generals Benjamin D. Foulois and James E. Fechet and Brigadier-General Henry C. Pratt (left to right) all are pilots. Foulois and Fechet today are retired.

ant publicity had at least served to focus the eyes of the public on the air service, had not labored in vain toward making their arm of the service an attractive one for its members and a useful one for its country.

The Air Corps Act of 1926 was passed.

The significance and far reaching effects of that piece of legislation are still being felt today. But at that time, the Air Corps had some excellent reasons for regarding itself as the nation's military under-dog. Promotions were snail-paced. The Chief had only one assistant. The enlisted personnel was too few in number to be very effective. The mortality rate was higher than any other arm or branch of the military profession.

Air Corps officers killed in line of duty did not necessarily leave vacancies in their own service. An Infantry officer, for example, might be promoted as the result of an Air Corps casualty simply because all officers hold their ranks in numerical order and are advanced accordingly. That fact alone greatly depressed the morale of the Corps.

Not, however, that the Infantry or Cavalry or Artillery was pleased at this ironic twist of fate. It will be recalled that during the agitation for a separate air service many high commanders of ground troops were decent and honest enough to stick their official necks out to the extent of admitting or publicly pointing out this evil.

But the change began in 1926.

With Foulois in office, things began to hum. Foulois could just about out-fly any officer in his command. He was a great believer in Air Corps officers being pilots. It was a strange idea at that time, perhaps, to the Army, but Foulois tightened up the requirements, got Majors and Colonels into cockpits and established minimum air-hour regulations. It didn't make Benny popular in some quarters, but Benny was primarily interested in building a real Air Corps and the resentment soon died down.

Air Corps history began to be written in bold strokes. Foulois' predecessor, Major-General James E. Fechet, also a hard-flying pilot, was a believer in getting things properly organized. He overcame many obstacles and paved the way for the fiery Foulois.

It is at the present time not merely a tradition that Air Corps generals be pilots. In common with other arms of the service, the Corps has issued orders to the effect that general officers must serve in the field with troops. This means they must be able, if needed, to lead their men personally and in the flying service, this naturally would require flight. In practice, however, generals would not take to the air unless they were leading their entire command. Operations of lesser units would be directed from the ground.

The evil of slow promotions was eliminated by the simple expedient—although it was no simple job to put the regulations through—of making temporary promotions. The number of officers affected was made even larger by a supplementary regulation that only those holding

(*Continued on page* 74)

the NATIONAL AIR BOARD Says...

Dr. Alexander Klemin, Chairman

AT its 25th meeting the Air Board welcomed a number of guests: A. M. Bremer, counsel for the Air Service during the War; Dr. H. L. Hood, a noted educator; and C. C. McLane, a distinguished member of the New York bar. The meeting was devoted mainly to a discussion of the McCarran-Lea Bill for the establishment of a Civil Aeronautics Authority, of which Mr. McLane gave a brilliant expose. Subsequently the Board sent an urgent telegram to the President in regard to this highly important legislation.

Pocket Veto was Feared for Civil Aeronautics Authority Bill

Mr. McCarran in the Senate and Mr. Lea in the House had introduced a bill for the establishment of such authority almost simultaneously. Passage in each House of Congress was followed by a Conference Report, which reconciled all difficulties. Yet, since the President had said that he favored the regulation of civil aviation by the I. C. C., a pocket veto (that is a veto by virtue of simple neglect to sign by the President) was feared at the very moment when the Air Board was discussing the topic.

Many Fine Jobs

Without cynicism, but merely as a statement of fact, Mr. McLane pointed out that the Conference had in all cases decided on the maximum number of well paid posts that either bill had provided. To the natural gratification of our politicians, there will be appointed five members of the Authority at $12,000 per annum; an Administrator at $12,000 per annum; members of a Safety Division; a Director of the Safety Division; secretaries and other well remunerated posts. The new Authority is apt to be quite expensive.

Present Function of I. C. C., Post Office and Bureau of Air Commerce to be Taken Over

Today the regulation of Civil Aeronautics, the fixing of air mail rates, etc., is divided between the I. C. C., the Post Office Department and the Bureau of Air Commerce. The new authority will assume all these functions. It will regulate the air carriers in every respect: charges, certificates of convenience and necessity and all similar matters. When the Post Office and the I. C. C. pass over their present functions it is hoped in many quarters that higher rates, more stability and greater fairness for the air transport operators will follow. In fact many important new developments in air transport are said to be merely awaiting this stabilization of civil aeronautics.

The Secretary of Commerce will pass over to the Authority the entire present work of the Bureau of Air Commerce. The new Safety Division is expected to make a great effort for increased safety, to investigate accidents with more impartiality and to give greater publicity to the findings of accident investigation boards.

Much Opposition by Government Departments

It is an open secret that several interested government departments had fought both bills and that there was opposition in the highest quarters. But now everyone seems satisfied. The President's *amour-propre* has been satisfied because he will have exclusive control over the international side of Air Commerce. The Bureau of Air Commerce will be passed over to the new Authority with its present personnel intact (it is hoped) so that its experience will not be lost. And politicians will be happy over the many posts to be filled.

Cooperation with State Aeronautical Agencies

The above is specifically provided in the bill, but it is also expected that the federal government, by preempting the entire sphere of inter-state commerce, will control the situation, and avoid duplication of effort by such State agencies. Thus one of the main fears of aviation people will be removed; namely, that they would have to go through a double process of licensing, first by Federal and then by State authorities.

Borrowing on Aircraft

By the new bill so Mr. McLane informed the Air Board, all aircraft will be recorded, and once so recorded with the Authority, can be conveyed without further recording in different countries or states. This means that it will be possible to mortgage and otherwise borrow money on aircraft.

Duties of the Administrator

The Authority will guide policies and will act as a semi-judicial body. The Administrator will be the executive, with very wide powers in establishing airways, cooperating with municipalities in airport matters, surveying the airport situation on a national scale, etc. On him also will devolve licensing of aircraft and pilots, etc.

Grandfather Clause

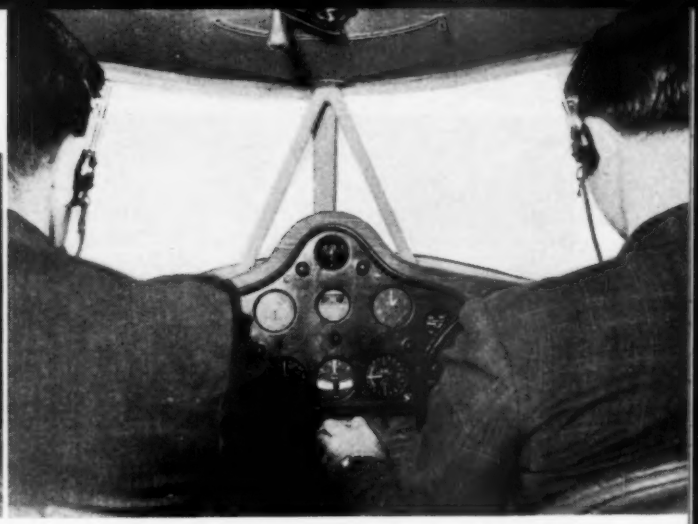
Do our readers know what is the Grandfather Clause? The Board did not. At any rate by the Grandfather Clause, operators who were active on May 14, 1938, will automatically receive certificates of convenience and authority to transport mails—which is as it should be. Air Mail Contracts terminating shortly, will be renewed in all probability on a fairer basis than when the customer (i.e. the Post Office Department) itself dictated terms.

Discussion by the Board

By unanimous vote the meeting thanked Mr. McLane for his clear exposition of the bill. Members were

(*Continued on page* 85)

The radio operator at the ground station remains at his post to follow the flight and relay messages concerning weather or operations.



With radio contact established, Pilot Scanlan (left) and Navigator Minnear were told that weather ahead was good.

GUINEA PIG LINE

by IRWIN WILLIAMS

They have a system down at Parks Air College well worth looking at. Part of students' curriculum is this full-fledged airline.

FIRST FLIGHT OFFICER NICHOLAS W. SCANLAN held the nose of his plane, officially designated NC-17187, directly into the mid-afternoon sun. Four thousand feet below him were the gently rolling fields of western Indiana. Off to his right he could just pick up the silver ribbon which he knew was the Wabash river. The rhythm of the clear on-course signal of the range beacon came through the phones clamped over his ears.

The occasional crackling of turning sheets of paper, which penetrated the steady drone of the motor, told Pilot Scanlan that Flight Agent George Long was busily making out his "passenger", "mail" and "express" reports. Lang would want everything in order preparatory to checking out when the landing was made some 90 minutes later. With a map before him and his flight calculator at hand, should need for it arrive, Navigator Paul B. Minnear checked speed against scheduled time.

The flight seemed to be progressing satisfactorily. Still, Flight Officer Scanlan shot a questioning glance at his navigator. The reason was readily apparent. In front of him and far to the right and left was a thick mass of cumulus clouds. NC-17187 was beginning to nose its way into the lower layers. Wisps of clouds played off the ends of the wings. Occasionally the sun was hidden, and high to the left thunderheads were forming.

Four hours earlier Meteorologist Eduard S. Walden had studied the weather map, and with Flight Superintendent Harold S. Woodring, concurred in a flight plan based upon an expectation of ample ceiling throughout the flight with no precipitation. Possibly he had been mistaken. Perhaps it was closing in in front. With a deft movement Scanlon dialed his radio to 278 and spoke into his microphone:

"NC-17187, Pilot Scanlan calling Terre Haute. NC-17187, Pilot Scanlan calling Terre Haute. Go ahead."

A brief pause, and the earphones replied: "Terre Haute calling Pilot Scanlan NC-17187. Terre Haute calling Pilot Scanlan NC-17187. Go ahead."

With radio contact established, Pilot Scanlan soon received the assuring information that the weather was satisfactory and he could go ahead to his destination. He smiled his approval of the work of the ground crew, descended to the 2,000-ft. level and proceeded to an on-

The reservation agent has his problems when, at the last moment, an unreasonable passenger demands service that cannot be extended him.

The big table in the meteorological department is used in making last-minute alterations in vital weather reports.

Meteorologists (above and right) have been compiling weather data since 5 a.m.

time landing at Parks airport. . . .

That was the conclusion of another scheduled flight of the Parks Air College Airline carrying "passengers, mail and express." The P.A.C.A. is now in its fifth year. All details of operation are carried out by advanced students of the professional flight and executive school and the aviation operations and executive school. As a training project it has proven invaluable because it gives opportunity for the practical application of knowledge and skills acquired in 18 months or more of study in piloting including night flying and radio beam and instrument flying; in navigation, meteorology, radio, aviation mechanics and various executive subjects. It puts into use the "learning by doing" method of training. Since, prior to and during each flight, it is necessary that 17 reports must be properly filled out and signed, the operation of the airline is valuable in developing the student's capacity to assume responsibility and quickly adjust himself to unexpected circumstances.

Twenty-eight advanced students are cooperating in the present operation. It happens that 14 are in Professional Flight, the other 14 being in Aviation Operations. It is, of course, the professional flight students who assume command of the plane and do the piloting. Each one flys a day-time round trip between Parks airport and Indianapolis and also one round trip, over the same route, at night. In addition he works out, while flying under the hood, various orientation problems by use of his instruments and radio.

But let's see for ourselves the activities which precede each scheduled flight. We need to arrive at the meteorological department not later than 7:30 in the morning, for the flight is scheduled to leave at 8:30 and an hour is required to complete preparations.

The moment we step in the door we hear the staccato chatter of the teletype. The meteorological department is a cooperative airways weather reporting station, so teletype weather reports are continually being received. Also, local observations are made and put on the teletype circuit at 27 minutes after each hour.

There, bending over a drawing table with a map of the United States before them, are the meteorologist for the day and his assistants. They are busily compiling weather information into a weather map and have been so engaged for some time.

Now other members of the class are arriving. First of all, they sign the officers-of-the-day sheet, attesting their arrival to take up the duties of the positions to which they have previously been assigned. During the project, positions are rotated so that each member of the class holds each position at least once.

The flight superintendent, the dispatcher and the navigator are gathering around the meteorologist. They want to know if the weather is such that the flight can be made with the proper degree of safety. They have had considerable experience during their training in making weather forecasts, but now it is more importance than ever before that the forecast be correct.

On the basis of the forecast the navigator begins making out a flight plan, provided it has been decided that the flight can go through. This plan, before it can become effective, must also be signed by the pilot for the day as well as by the line's flight superintendent.

At one side of the "passenger terminal lobby", seated or standing before their desks, are the passenger agent and the reservation agent. As quickly as possible, each secures information from the flight superintendent as to the probability of the flight leaving on schedule so that this information can be communicated to inquiring passengers, and reservations either made or refused. We see the reservation agent recording the reservations already made. If the flight for any reason is cancelled, he, of course, will have the added task of calling up each passenger in order to inform him of the cancellation. Supervising all this activity is the flight superintendent.

In another room of the terminal building we find the station agent with reports which have been handed him by the passenger reservation agent. He is estimating the load that will be carried on the flight: "pasengers" and also "mail" and "express". (Since this is a training project and not a commercial operation, a revenue producing load cannot be carried. However, commercial airline operations are otherwise duplicated, students serving as passengers and dummy sacks of mail and express packages are used.) On the station agent rests the responsibility of seeing that the maximum allowable load on the flight is not exceeded. If the payload is so large as to exceed the allowable load, the station agent will proceed to figure the amount of gas that can be carried and still remain within the total load limit. If, in doing so, he can stay within the Department of Commerce requirement, he will reduce the fuel load in order to accommodate all the payload. After checking and rechecking the report on load, the report is forwarded to the mechanics and their assistants for the day.

Leaving the terminal building, we hurry to the line service hangar. Here we find the mechanics with their assistants running up the engine, checking the proper functioning of the engine and of various engine instruments, and also checking the plane controls. With the station agent's instructions at hand relative to fuel loading, the plane is wheeled to the fueling station and the number of gallons of fuel designated by the station agent taken on.

In the cockpit are the radio operator and his assistant. They are checking with radio men at the ground station the functioning of the two-way radio and making alterations or adjustments that are called for.

The pilot for the day—now that the flight plan has been completed and properly signed—is coming with the other members of the crew to take over the plane. The engine has been shut off during fueling. Entering the cockpit the pilot, on a signal from the mechanic-in-charge, starts the motor, checking for himself the functioning of the motor, all instruments and controls.

The time for departure is approaching. Returning to the terminal building, we find the ticket agents extremely busy.

(*Continued on page* 89)

As pilot of the "Early Bird", Don Walker has performed many unusual missions. The Lockheed is equipped with every known navigational and engine device.

EARLY BIRD

by VIRGIL E. LaMARRE

The Detroit News is one of the most progressive of air-minded newspapers—and it lives the part.

THOUSANDS of Detroiters lined the banks of the Detroit River. Others scuttled along close to shore in small boats, while still greater numbers in downtown office buildings forsook desks and typewriters to collect around windows and upon roofs. The date was September 10, 1912.

Object of all this attention was a queer looking creation dubiously described as a "hydro-aeroplane." A Burgess-Curtiss biplane built under Wright patents, its temperamental four-cylinder engine operated twin chain-driven propellers. Judged by present day standards, its performance was anything but reassuring. Forty-five miles per hour was tops, 36 m.p.h. stalling speed. But to the thousands who watched its slowly revolving propellers in anticipation of the projected flight the little ship was a man-made miracle.

The plane's motor was already warmed when a truck bearing a bundle of newspapers arrived at the dock. Promptly the pilot strapped these to the empty seat to his right and cast off. A few minutes later after chugging bravely into the middle of the stream and turning into the gentle wind the little ship lifted her dripping pontoons from the water and pointed up the river.

Owner and pilot of that plane was W. E. Scripps, pioneer aviator and publisher, now president of The Detroit *News*, one of the world's largest newspapers.

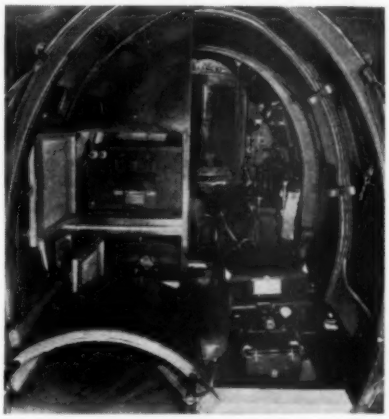
Scarcely before the ink on his cargo had dried Pilot Scripps landed safely at the St. Clair flats. The newspapers were promptly distributed to resorters far in advance of the accustomed time of delivery. More significant was the fact that the world's first aerial delivery of newspapers had been successfully completed.

During the next four years, in addition to serving as a useful and speedy carrier of news fresh off the presses, the seaplane proved useful for photographic purposes. Numerous spot-news photographs were taken by flying photographers intrepid enough to risk their necks in Scripps' creation of wood, wire and fabric.

As the accompanying photographs will testify, the *Early Bird*, now owned and operated by the Detroit *News*, is a far cry from the ancient "pterodactyl" piloted by the intrepid publisher-aviator. It is apparent that while more than a quarer-century has passed, the Detroit *News* still remains one-hundred-percent sold on the value of owning and operating its own aircraft. The enthusiasm of W. E. Scripps, Sr. (who, by the way, now is president of the Early Birds, that venerable organization of men who flew before 1916), is reflected in the sleek lines of the trim Lockheed *Orion Special* that reposes at Wayne County airport. In vivid contrast to the back-breaking preparation necessary to launch its predecessor into its element, the *Early Bird* can be warmed up and be off the ground six minutes after receiving its orders. This plane is used extensively by Publisher Scripps, his son W. E. Scripps, Jr., manager of the Detroit *News* broadcasting station WWJ, and by Managing Editor Frederick Gaertner for covering spot-news stories.

The *Early Bird* is plane number four in the string of Detroit *News* airplanes. True to the tradition for usefulness and safety established by the venerable

This camera is used by aiming the ship at the subject, much like a warplane.



The cabin contains collapsible desks, radio and a hatch for aerial cameras.

The photograph of a visiting Imperial Airways flying boat was taken with the "Early Bird's" novel camera.

Burgess-Curtiss its predecessors, a Lockheed *Vega* and Pitcairn autogiro, completely equipped for aerial photography, covered thousands of miles transporting executives and reporters and picture-taking missions without a single forced landing or other mishap. The *Vega* alone, piloted by former aviation editor James V. Piersol (now aviation editor of the New York *Times*) flew 121,511 miles without serious trouble of any kind before finding a permanent refuge in the Ford Museum at Greenfield Village.

Costing an estimated $50,000 the *Early Bird* is a standard *Orion* in appearance only. Powered by a Wasp S-1D-1 550 h.p. *Wasp* and equipped with variable pitch propeller, retractable landing gear and flaps, the ship has a high speed of 232 m.p.h at 5,000 feet, cruises at 205 m.p.h. for 1,000 miles without refueling. In addition to a Sperry automatic pilot (which Don Walker, pilot of the *Early Bird*, asserts he uses at all times during cross-country flying) the plane is equipped with every known engine and navigational device including inter-plane telephone and two-way radio with a 50-watt transmitter.

The *Early Bird* is specially equipped for photographic and spot news coverage. The spacious cabins accommodates three persons while the pilot sits in his office directly behind the engine. The cabin contains a collapsible desk large enough to accommodate a typewriter. Sliding doors in the floor and right side of the cabin permit photographers to snap pictures from any angle. The plane is equipped with three Fairchild aerial cameras. A camera mounted in a small nacelle fastened to the leading edge of the left wing is used on most assignments. It is fixed, the pilot aiming the camera by aiming the entire airplane and lining up his subject in a regulation machine gun sight mounted on the windshield. The camera is snapped by a button trigger on the handle of the control stick in pretty much the same fashion as combat pilots trip their weapons. The camera is equipped to take 110 exposures at five second intervals with one loading. The gun sight enables the pilot to spot the center of the object being photographed with deadly accuracy; in fact within one-sixteenth of an inch from the center of a 7 x 9 negative.

To date the *Early Bird* has logged over 600 hours flying over the United States, Canada and Mexico. The sturdy craft has played an interesting role in many a real life drama. During the 1937 flood

The Detroit News' first airplane (top) and W. E. Scripps seated at its controls.

Pilot Walker, Mechanic Anthony Saley—whose full-time job it is to keep the ship in perfect condition—and John Carlisle, *News* feature writer, flew over the flooded areas surrounding Cincinnati, Louisville, Evansville and other cities. Using Memphis and Indianapolis as headquarters the *Early Bird* flew high and low over the Ohio and Mississippi valleys and returned with first hand information and dozens of exclusive aerial photographs. If pressed to describe the most touching scene that met his gaze in that desolate area, Don will tell you it was the frantic signals of persons marooned on the tops of buildings.

As pilot of the *Early Bird*, Don Walker has performed many unusual missions. But the most unusual, he confesses, was the job of scattering the ashes of a newspaper editor high over Lake St. Clair. This was accomplished by emptying the urn through the camera port in the floor of the cabin.

Another unusual mission of the *Early Bird* sent her blunt nose pointing toward a dude ranch in Wyoming in 1936 with the ailing Tiger Manager Mickey Cochrane aboard.

On another occasion the banner of the law waved proudly from the *Early Bird's* figurative prow when it was used to rush detectives to New York City following the capture of the notorious Merton Ward Goodrich.

Again the *Early Bird* served as a protective mother-bird in preserving the lives of countless thousands of feathered folk during the severe winter of 1936. When,

(*Continued on page 76*)

For Private Flying

A PRIVATE Flying Section, devoted to the encouragement and stimulation of all phases of private flying, is being established in the Safety and Planning Division of the Bureau of Air Commerce, Department of Commerce.

The new section is being formed in order that the Bureau may more effectively discharge its functions in connection with the fostering of private flying (as distinguished from airline operations), including flying for sport and pleasure, business, student instruction, fixed base operations and other types of non-airline flying.

The Private Flying Section will determine and analyze the problems of the private flyer and will guide the Bureau in its regulations and actions affecting this branch of aviation. It is further intended that the conclusions reached by this section will serve to influence Federal national policies governing the regulation and fostering of private flying. One of the first duties of the section will be to survey and analyze the entire existing situation in order to recommend specific projects to be undertaken.

For the purpose of furnishing an additional means of contact with the private flyer, the Bureau plans to organize a Private Flying Advisory Committee to be composed of 20 members, representative of all branches of non-scheduled operations. This committee will work through the new section and will also serve as an advisory counsel to the entire Bureau on all matters affecting flyers in this category.

In the past the Bureau has found it difficult to reach an understanding of all problems confronting private flyers due to their lack of group organization. It is believed that with the formation of the new section and the advisory committee, both of which will be devoted entirely to private flying and in close contact with it, the Bureau will be in an advantageous position to furnish the attention and cooperation needed.

In a further effort to encourage and stimulate private flying, the Bureau plans to make a survey of medical qualifications required of pilots in this group for the purpose of ascertaining the possibility of safely permitting a larger number to enter aviation than can do so now under existing regulations.

The Safety and Planning Division, of which the new section is to be a part, was esatblished early last year for the purpose of coordinating all projects and special studies bearing upon the development and safety of aeronautics. This division consists of seven sections which are now carrying out projects concerned with problems relating to aircraft, airports, air transport, international aviation, power plants, and radio development.

BOMB BOAT

This is the Short "Sunderland", military version of the ocean-spanning Empire flying boat.

Personalities

Edward J. Noble, prominent businessman and flyer, is Civil Air Authority head.

Youngest stewardess in the business is pretty Joan Denton, 21, who flies United.

Death has taken another famed aviation man: Harry Wetzel of Douglas Aircraft.

Athol ("Bud") Chapman, 16, of Bakersfield, Cal., (right) recently won a gas model contest, got his award from Flyer Ray Milland, Paramount star.

Earhart-looking Mrs. Mabel Rockwell is the only woman aeronautical engineer in the United States.

Bob Morse, California inventor, claims to have made 30 flights with the 120-pound glider he has strapped to his body. His movements control the craft.

Carl Wootten, former Taylorcraft sales manager, recently became Aeronca's vice-president for sales.

Isabel Steiner, member of Stanford University's flying club, accepted the Loening Intercollegiate trophy recently in behalf of her club, posed with Pilot Leland Andrews.

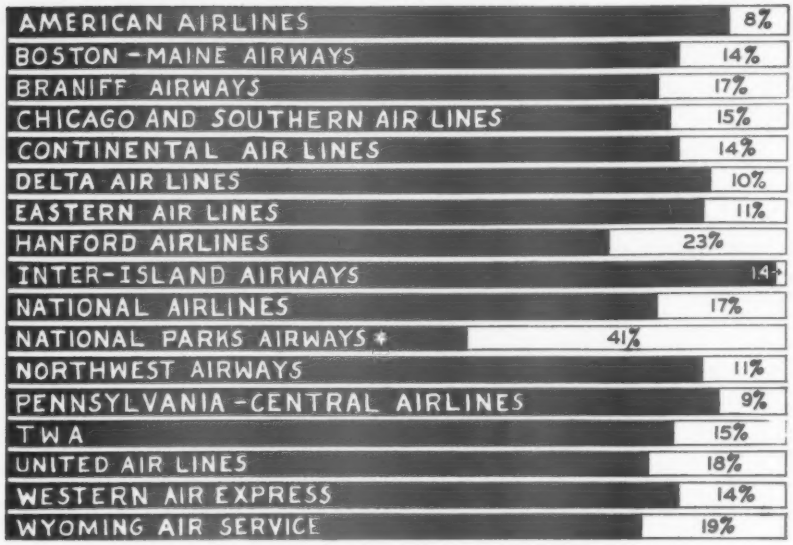
Max Schmeling defied his promoter and flew with famed Dick Merrill to fight Joe Louis.

Majors John K. Cannon and William S. Gravely of the 19th Bombardment Group inspect a new model "transport".

Sally Rand has a soft spot in her heart for balloons (remember?). Braniff Airways press agents got her to pose with a weather bureau balloon.

Now navigator aboard Richard Archbold's Consolidated flying boat "Guba" is Lewis A. "Lon" Yancey, famed Maine-Rome flyer and explorer in Yucatan.

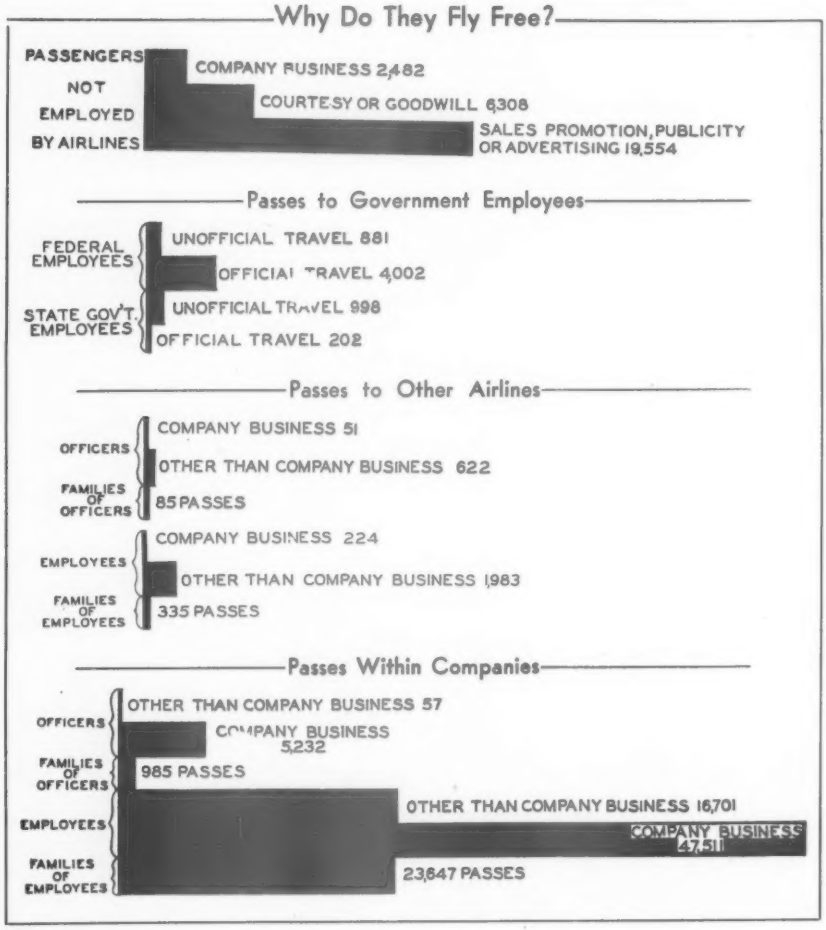
"Jack" entertains Manhattan's seaplane pilots by diving for coins in a pail, never emerging empty-mouthed.



ANNIE

by E. STANTON BROWN

This is the story of how U. S. airlines gave away close to $4,000,000 last year. Not in cash, but in the form of that airline phenomena—the free pass. This exclusive article—the first complete one on the subject—marks the August 23 death knell of the free pass.



EVER since the carrying of mail, passengers, and express was turned over to private enterprise in 1926, the airlines have had to contend with a situation which has become more ponderous year by year—passes. The question of free transportation has reared a head that has been growing uglier and uglier and, like the head of Medusa, is crowned with a constantly increasing number of serpents.

Abuse of the pass privilege, both by the airlines themselves and by those who received free transportation, has resulted in particular note being taken of the matter in an Act of Congress. Beginning in August (just about the time this issue gets to you) strict limitation will be imposed by Federal authority. First official note of the pass situation was taken by the Interstate Commerce Commission in 1935. It was then that airlines were required for the first time to render an accounting of free transportation they issued.

An increase of 35.69 per cent in the number of pass passengers carried in 1937 over 1936 may have been at least partly responsible for the stringent action which has now been taken.

Last year (1937) 17 airlines in the United States (including Inter-Island Airways operating in Hawaii) gave away 135,000 free passes for transportation over their systems. If these pass passengers had purchased their tickets, the amount of revenue would have amounted to the staggering sum of almost *four million dollars!*

In that same year, most of the 17 airlines operated at a loss while a few showed a small profit. The question naturally arises as to whether or not the pass situation is responsible for some of the loss. Those who are outside airline circles—particularly stockholders—cast a suspicious glance at airline directorates when confronted with the fact that *approximately 12 per cent of all airline passengers travel free.*

In the past year, among the leading airlines, United Air Lines alone *gave away* transportation amounting to $1,250,000 TWA and American Airlines—more than $750,000 each; and Eastern Air Lines more than $250,000.

Many a fare-paying passenger has looked askance at a fellow passenger traveling on a pass and has felt resentment at what seemed to him to be needless discrimination. When one planks out close to $200 for a round trip ticket from Chicago to the West Coast and then finds that some airline has presented the same transportation to a sometimes ill-mannered individual who calls attention to his privilege, a feeling

OAKLEY, INC.

of resentment is hardly an unusual emotion.

Is the airline pass situation, then, a racket?

WHO TRAVELS FREE?

Let's assume the attitude of the fare-paying passenger. Let's look at the fellow who has $200 worth of *free* transportation tucked away in his pocket; who sits in the same kind of seat in the same airplane; who eats the same food and receives the same services as you do—*you* who paid out cold, hard cash for the same thing he gets for nothing.

He will fall into one of eight classifications as shown in the chart. The chances are 2 to 1 that he is in the employ of the airline; 4 to 1 that he is *not* in the airline's employ, is *not* related to an airline employee and is *not* connected with the Federal or state government, and 5 to 1 that he is an airline employee's relative.

For the most part he is riding *subject to space*. In other words, if the airplane fills up with fare-paying passengers, he has to give up his seat, get off, and wait for the next plane. About 6½ percent of pass passengers travel on a *positive* basis and are classed the same as cash customers.

It is the 4 to 1 shot—the fellow who is not connected with the airline—who causes the most grief. Many times he is a nuisance to the airline and other passengers. Many times airlines make fools of themselves over him.

A classic example of this type is a certain newspaper man who, among other duties, is aviation editor of a well-known midwestern daily. This man (we'll call him Bushmonger) asks for at least a couple of passes a month, sometimes more. If he is refused, he promptly throws all press releases from the offending airline into the waste basket. He resorts to threats to gain his end. When he is granted a pass, he always arrives at the airport in varying degrees of inebriation. If he is too drunk to be allowed on the airplane he becomes both obscene and profane, calls everyone's attention to the fact that he has a pass, and then proceeds to damn the airline.

Fare-paying passengers look on this man and wonder what kind of airline would give him a pass and, if so, why. The competitive airlines will then resolve not to give him a pass again. But airlines are renowned for double-crossing each other at every opportunity. If one of them does turn him down, he asks another and, in all probability, gets his pass. The airline that so favored him then reaps the reward in having their press releases given prominence until the next time they have a fight with him. And so goes the vicious circle, while an undeserving individual rides free and the airlines permit the racket to continue, even aid and abet it because of their distrust of each other.

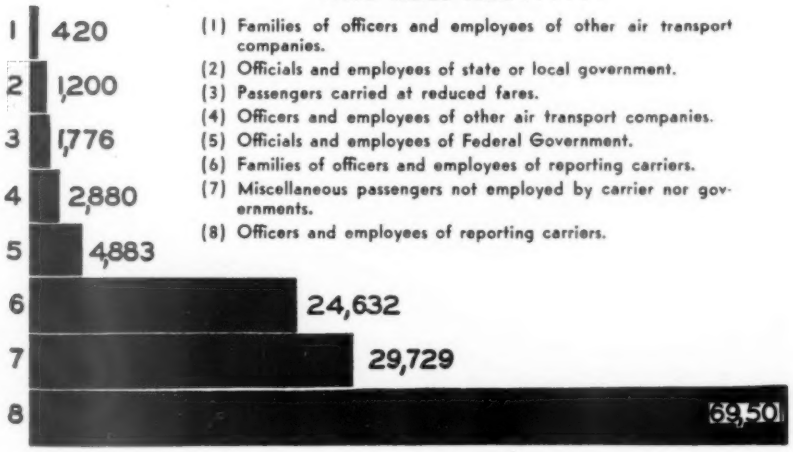
Others of this miscellaneous group will be hotel porters, newsworthy people, friends of airline officials, travel bureau employees, girls of questionable character (who have been given a pass by someone authorized to issue them, secured during a spree when the airline official has been exhibiting his importance in a bar), worthy and also crackpot writers, and a legion of indefinable people who somehow wrangle passes.

WHY DO THEY TRAVEL FREE?

If a large number of the miscellaneous group of pass passengers are a nuisance, why do the airlines countenance the racket? Figure 3 sets forth the reasons ascribed for issuing the passes.

Few questions need be asked regarding airline employees, government employees traveling in an official capacity regarding supervisory duties concerning the airlines and the families of employees. But questions do arise in regard to the some 26,000 non-revenue passengers in the miscellaneous group which used $1,000,000, or 25 per cent of the $4,000,000 worth of free trans-

WHO RIDES FREE . . . . . ?



(1) Families of officers and employees of other air transport companies.
(2) Officials and employees of state or local government.
(3) Passengers carried at reduced fares.
(4) Officers and employees of other air transport companies.
(5) Officials and employees of Federal Government.
(6) Families of officers and employees of reporting carriers.
(7) Miscellaneous passengers not employed by carrier nor governments.
(8) Officers and employees of reporting carriers.

COST OF PASSES

One $ sign equals $10,000
+ equals less than $10,000

American Airlines
$$$$$$$$$$ $$$$$$$$$$ $$$$$$$$$$
$$$$$$$$$$ $$$$$$$$$$ $$$$$$$$$$
$$$$$$$$$$ $$$$$$$$$$ $$$$$$$$$$
$+ ($918,390.72)

Boston-Maine Airways
$+ ($17,273.50)

Braniff Airways
$$$$$$$$$$
$+ ($116,926.82)

Chicago and Southern Air Lines
$$$$+ ($42,942.30)

Continental Air Lines
+ ($9,554.15)

Delta Air Lines
$$+ ($26,885.08)

Eastern Air Lines
$$$$$$$$$$
$$$$$$$$$$
$$$$$$$$$$
$$$$$$+ ($363,680.85)

Hanford Airlines
$$$+ ($35,171.13)

Inter-Island Airways
+ ($5,965.00)

National Air Lines
+ ($7,629.60)

National Parks Airways
$+ ($17,798.97)

Northwest Airlines
$$$$$$$$$$
$+ ($118,353.68)

Pennsylvania-Central Airlines
$$$$$$$+ ($79,442.20)

TWA
$$$$$$$$$$ $$$$$$$$$$
$$$$$$$$$$ $$$$$$$$$$
$$$$$$$$$$ $$$$$$$$$$
$$$$$$$$$$ $$$$$$$$$$
$$$+ ($830,885.30)

United Air Lines
$$$$$$$$$$ $$$$$$$$$$
$$$$$$$$$$ $$$$$$$$$$
$$$$$$$$$$ $$$$$$$$$$
$$$$$$$$$$ $$$$$$$$$$
$$$$$$$$$$ $$$$$$$$$$
$$$$$$$$$$ $$$$$$$$$$
$$+ ($1,223,444.77)

Western Air Express
$$$$$$$$+ ($82,569.60)

Wyoming Air Service
+ ($9,437.45)

portation issued in 1937.

One of the prime rackets in the abuse of airline passes is the "I've given you some publicity (or I'm going to), now I want a pass." A fair but forceful lady, by way of example, called at the general offices of a large airline. She bubbled with enthusiasm. She wanted some pictures from the publicity department. She was going to put them in some local magazine. They would do the airline no end of good; dollars would flow into the airline coffers in a rich stream after she had run the pictures. The airline smiled and gave them to her and she left, still bubbling.

Time passed. About enough time, that is, to permit her to reach the first floor of the office building and enter a telephone booth in the building's drug store. The phone rang in the publicity director's office and he was astounded to hear this lady's voice request two round-trip passes from Chicago to New York. She didn't get them. On the other hand I have known of other airlines to give out passes for reasons just as ridiculous.

On the other side of the fence, this same airline was waiting for a certain gentleman, who had given them a lot of publicity, to ask for a pass. Finally, they offered him one, unsolicited. He refused with thanks.

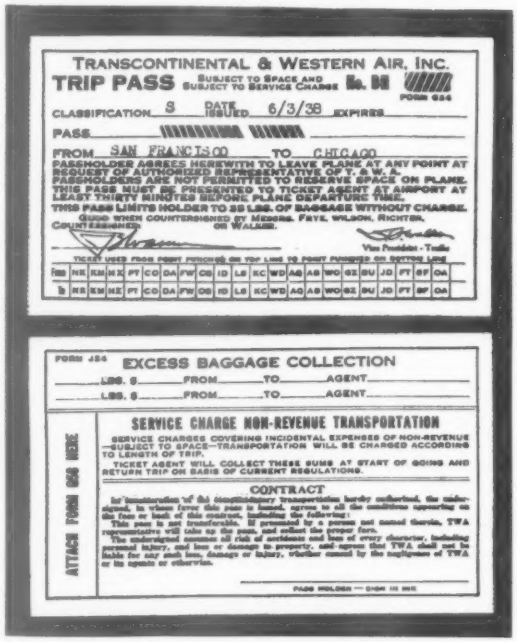
To revert to the theme of airlines double-crossing each other, there is a little game which seems to be played by all and sundry. One airline will discover that an important individual has made a reservation on another line as a cash customer. Whereupon the important personage is contacted and offered free transportation, it being stated in honeyed accents that they would be delighted if he would but travel as their guest. The airline that collected cash quite often has to refund it while the important personage looks down his nose at the stupid company that failed to recognize his "true worth."

Then there is the little game of bribing agents with free rides. Almost every hotel porter, all telegraph offices, travel bureaus, and yes—even information clerks in the employ of railroads—are classed as agents and are paid commissions officially or unofficially, for making reservations. In large cities where competition is hot and heavy these agents are pampered like prima donnas. Airlines know that if one turns an agent down he will get a pass from a competitor and said competitor will undoubtedly be favored in the information given out and by the resulting reservations handled by the agent.

To gain a current example of such thinly veiled bribery a friend of mine walked up to the porter's desk in the Stevens Hotel in Chicago. He asked for air service to Kansas City. Now, there are two airlines operating almost parallel schedules between Chicago and Kansas City—Braniff Airways and TWA. The porter quoted only TWA service! Why? What do you think! And the real goat is the long-suffering cash customer who has had information withheld from him regarding service which might be more suited to his needs.

Airlines have been trying for years to educate travel bureaus to the point where they will give out airline information on an equal basis with rail transportation. To date, with a few outstanding exceptions, they have been unsuccessful. But these same travel bureaus, as well as steamship offices, are among the leaders in asking for free air transportation. And the airlines give it to them! But this group of pass-chiselers still does more asking and more talking—and less in return for the favors—than any other collective group.

On more than one occasion the air-



TRANSCONTINENTAL & WESTERN AIR, INC.

TRIP PASS Subject to Space and Subject to Service Charge No. H

Form 634

CLASSIFICATION S RATE ISSUED 6/3/38 EXPIRES

PASS

FROM SAN FRANCISCO TO CHICAGO

PASSHOLDER AGREES HEREWITH TO LEAVE PLANE AT ANY POINT AT REQUEST OF AUTHORIZED REPRESENTATIVE OF T. & W. A. PASSHOLDERS ARE NOT PERMITTED TO RESERVE SPACE ON PLANE. THIS PASS MUST BE PRESENTED TO TICKET AGENT AT AIRPORT AT LEAST THIRTY MINUTES BEFORE PLANE DEPARTURE TIME. THIS PASS LIMITS HOLDER TO 25 LBS. OF BAGGAGE WITHOUT CHARGE.

Good when countersigned by Messrs. Frye, Wilson, Richter, Courtleigh or Walker.

Vice President - Traffic

TICKET USED FROM POINT PUNCHED ON TOP LINE TO POINT PUNCHED ON BOTTOM LINE

FEB	NE	KM	NX	PT	CO	OA	FW	OG	ID	LS	KC	WD	AQ	AS	WO	GZ	DU	JO	FT	SF	OA		
5	NE	KM	NE	PT	CO	OA	FW	OG	ID	LS	KC	WD	AQ	AS	WO	GZ	DU	JO	FT	SF	OA		

Form 484

EXCESS BAGGAGE COLLECTION

LBS. @ FROM TO AGENT

LBS. @ FROM TO AGENT

ATTACH FORM 650 HERE

SERVICE CHARGE NON-REVENUE TRANSPORTATION

SERVICE CHARGES COVERING INCIDENTAL EXPENSES OF NON-REVENUE TRANSPORTATION SUBJECT TO SPACE—TRANSPORTATION WILL BE CHARGED ACCORDING TO LENGTH OF TRIP.

TICKET AGENT WILL COLLECT THESE SUMS AT START OF GOING AND RETURN TRIP ON BASIS OF CURRENT REGULATIONS.

CONTRACT

In consideration of the complimentary transportation hereby authorized, the undersigned, to whom letter this pass is issued, agrees to all the conditions appearing on the face or back of this contract, including the following:

This pass is not transferable. If presented by a person not named therein, TWA representatives will take up the pass, and collect the proper fare.

The undersigned assumes all risk of accidents and loss of every character, including personal injury, and loss or damage to property, and agrees that TWA shall not be liable for any such loss, damage or injury, whether caused by the negligence of TWA or its agents or otherwise.

PASS HOLDER — SIGN IN INK

A typical "space available" pass.

lines have decided to present a united front to the pass chiselers and to play fair and square with each other in regard to bribing agents with transportation. On just as many occasions, the meeting has hardly broken up before one or more of the airlines are "breaking their necks" to tell the more important agents that they will be taken care of in spite of the new ruling.

Local politicians form another group catered to by the airlines. One airline has its personal property taxes materially reduced in one city because it gives free rides to the reigning politicos. In that same city, well-known for the hold a political boss has on it, an airline executive was robbed while leaving the airport in his car one night. He called up a politician to whom he had given free transportation. The politico asked for his car license number and the next day the stolen booty was returned. After that the airline official had no trouble and he continued to give passes to the politicians.

Passes are a very convenient form of buying for nothing almost anything in the way of advertising, publicity and good will. They have been used to good advantage and they have been misused shamefully by both the pass chiseler and the airlines themselves.

PASSES AND AIRLINE LOSSES

It is almost impossible to state how many of the free passes issued would have been replaced with a cash ticket or a reduced fare ticket, if they had been refused. It is safe to say, however, that the great majority of passes are issued to people who would not have purchased a ticket at either the full tariff rate or at a reduced rate. For the most part they have been issued because the pass holder presumably can do the airline good through his contact with the traveling public, either through the press or by direct contact. The cost of issuing the passes is almost negligible. Since most pass passengers ride in seats not occupied by fare-paying passengers, there is little actual loss in revenue.

ARE PASSES JUSTIFIED?

Joseph B. Eastman, when acting as Federal Coordinator of Transportation, states in his *Passenger Traffic Report*, "In few, if any, other large industries (other than transportation) does the condition (passes) exist. No matter how stringent the laws may be, so long as there is any free transportation, abuses, favoritism and even rebates will arise. . . . In the present unhappy state of the passenger business, free service of any sort should be eliminated."

It is not the purpose of this article to take issue with, or justify, Mr. Eastman's statement. However, it may be well to include a few pertinent remarks. It should also be pointed out that, according to a survey by Mr. Eastman 72 per cent of travelers stated that transportation personnel needed training. Looking at passes for employees in this light, it might be said safely that educational passes and vacation passes are not out of line. The more an employee is able to get over his system, as well as other systems, the better qualified he is to speak authoritatively about his profession.

Such, however, is not the viewpoint of some airlines. American Airlines, for example, surrounds the giving of a pass to an employee with the holiness and reverence of a blessing from heaven. Employees' passes are limited in mileage, according to their length of service with the company. It is necessary for an employee of American Airlines to have been with the company for from four to five years before he can secure a pass on his vacation to enable him to cross the country and return.

United Air Lines, conversely, encourages its employees to get out over the system. When the first vacation period rolls around the employee may travel the length of the system.

(*Continued on page* 68)

WARDEN WITH WINGS

by

CHARLES MORROW WILSON

The State of Maine has found another use for the airplane. The result is that that state has one of the few flying game wardens in the country.

"The Maine game warden (above) turned out to be a dapper young man in a swank blue uniform with a pair of silver wings. Ned Hutchinson is the name." Maine's game commissioner bought the above Stinson after seeing its original young owner crack it up.

I HAD gathered from fiction that Maine game wardens are picturesque duffers who wear 'coonskin caps, red mackinaws, long whiskers, and snowshoes which they grease from a backpack of jerked moose meat.

But the Maine warden with whom I was teamed turned out to be a dapper young man in a swank blue uniform with a pair of silver wings just above his right lapel. Ned Hutchinson is the name, and at 30 he is the nation's first career pilot-warden. He is slender, blue-eyed and raspy voiced, walks and drives with the high-chinned forwardness of a West Pointer, yet damns the Army heartily.

We drove out to a lake air-landing near Augusta, loaded into a neat red Stinson seaplane. Ned pulled the starter, fondled the hand throttle to let her warm, and weighed anchor by touching a floor button. Then we soared away above a stupendous bouquet of autumn woods.

Before we were five miles beyond the last fringe of farm houses, the pilot-warden tapped his window. A fat black bear, trailed by an equally fat cub, was ambling leisurely beneath us. Ned dived at them, but the bruins didn't choose to notice. We saw a small drove of deer grazing in a creekside clearing. Ned marked the spot on his hand map. It will probably turn out to be a winter "yard" for deer, after the big snows start.

There's quite a knack to looking from the air. Besides watching the woods below you, you've got to keep an eye on the 19 dials on and about the instrument board, not to mention keeping both feet in harness, the wheel under control, and a knowing right hand on the throttle stick.

Pilot-Warden Hutchinson confesses that he has had some highly revealing lessons in air observation. In the checkerboarding of farms and ranges which separate Maine's capital from the big woods and uncharted lakes, is a nudist colony. It's one of those free and open locations where bright summer sunshine does a great deal. We aren't telling the exact location of this undraped paradise. To advertise the site would bring on an aeronautic camp meeting. But flying over this sylvan retreat is a superlatively good way to develop powers of observation. Taking it at five hundred feet is positively educational, and no ambitious warden will deliberately neglect an educational opportunity.

When one's afoot the big woods may seem sombre. From the air they seem jovial and warm. But for game observation, 2,000 feet and under is ideal, with a maximum flying speed of 120 miles an hour. Wild life rarely notices a plane flying higher than 500 feet.

We swung north and east toward the great brown hulk of Katahdin, landmark mountain for all the Maine woods. The first ray of morning sunlight to touch the United States falls on Katahdin's tip. That has been going on for a long time.

We ran into a high skit of snow, fat soft flakes made golden by morning sun. Beneath us they changed to slow rain that splattered down on the wonderland of leaves below. Swinging on toward the basin of the St. John led to a truly remarkable break, even for a game warden who flies a plane. Ned spotted a bald eagle perched in the tip of a tall pine tree. A generation ago, real eagles were comparatively common in the great wild Northeast frontier. But to spot a live eagle nowadays is a once-in-a-lifetime adventure. Ned circled and dived at the big pine tree. The "emblem" bird failed to move. He just sat there as if in profound contempt of puny mortals and their toys called airplanes. Or maybe the eagle was still sore about his involuntary association with the NRA.

We started to follow a backwoods river which lay beneath us like a rope of silver. After two or three minutes, Ned nodded with great conviction. "Looks like a good stream to stock with hatchery trout."

There are thousands of creeks and rivers in the big woods. From the ground it's hard to judge which are best suited for trout stocking. Trout thrive best in clear cold water that is fed by plenty of shaded springs. From the air you can spot the springs, tributaries, and water slopes quite easily.

We circled the Quebec boundary, turned down the great lake-splotched basin of the Allagash. Here are a hundred stretches of woods which have never been formally surveyed, a country wholly without roads, and a land through which

One of the first successful "skyfeeders" is Lieut. Earl Crabb, former R.A.F. ace.

few white men would want to travel afoot.

But Maine's flying warden is entirely accustomed to such a course and carpet. Ned's is a life of forced landings and blind flying. A winged warden simply can't stay with tried and charted routes. You've got thousands of miles of wide open spaces to patrol. You can't depend upon ground landing because there isn't enough cleared space. You've got to use pontoon landing gear in summer and rely on ski landings in winter. Plenty of times you'll find yourself having to circle down 3,000 or 4,000 feet to take a pond or river bend so small that you are lucky to have 15 feet of clear space beyond each wing. Sometimes the water is rough. That means you've got to nose high, and tail to the waves or current. Big metal surfaces of the pontoons sometimes take a terrific beating from the waves.

There's always danger of jetting rocks or logs which can't be seen from the air. If you smash a propeller or log a pontoon it's most definitely too bad. So in flying the big woods you find yourself continually peering for the next and nearest blue lake or ribbon of river. With a sturdy plane there's a chance of getting out alive even if you tangle with the treetops. It isn't a very healthy chance. In winter service, ski landing is a necessary business with plenty of sport thrown in for good measure. Smooth ice or snow isn't always findable. And there's the morning-after job of digging the ski gears out of snow and frozen slush.

"WOW!"

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Here again, the effectiveness of air patrol is largely a matter of geography. About three-fourths of the entire area of Maine is in forests and woods. Of these, about 9,000,000 acres are still beyond reach of public or private roads. These roadless wildernesses fall into three great areas. The biggest is in Piscatquis and Aroostook counties, a vast lake-dotted forest of about 5,000 square miles and one of the biggest reservoirs of wild-life on the continent.

In summer, the game-carrying resources of this area are enormous. But winters bring paralyzing snows—seven feet on the level is not exceptional. During the long snow periods, deer losses from starvation are believed to average between 25,000 and 30,000 a year—half again as many as are killed by hunters.

After the deer have yarded for winter, the penned flocks are usually numerous enough to tramp down the snow and keep alive by eating bark and evergreen foliage. But long continuation of the big snows eventually exhaust this fare. The animals become too weak to break a way to further forage. So they frequently starve, or become so weakened that they die of pneumonia. Winter starvation is likewise the worst menace to the remaining population of moose and caribou.

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SUCH *Interesting* PEOPLE

by DICK KIRSCHBAUM
Aviation Editor, Newark, (N. J.) Evening News

Presenting definite proof that even an aviation editor has his ups and downs. And that some "celebrities" aren't all their press agents say.

THERE is nothing that burns up a reporter so much as to have some well-meaning person say "It must be wonderful to be a reporter; you meet so many interesting people!"

Burn up or not, it's the truth—especially when the reporter's beat is covering arrivals at an airport. Although my capacity is that of aviation reporter, the daily column I run is not entirely technical. It might best be called a modern version of a ship news column. And, because most important people—and that means interesting people—are pressed for time, they are the ones who employ the scheduled airlines for business travel.

I have interviewed statesmen, politicians (there is a difference, you know), actors, actresses, writers, explorers, fighters, golfers, auto racers, diplomats and even murderers. Some were friendly and easy to talk to, others were grumpy and reticent. The bigger the persons, the easier to talk to. Take for instance, Andre Kostelanetz, eminent musician and America's No. 1 airline passenger, as is attested to by his being twice awarded the combined airlines trophy. Kosty who, for months at a time, made two round trips to the Pacific Coast each week, is what we call a "swell egg." True, he has little to tell that is genuine news because he is practically a commuter, but he always has a smile and a pleasant word for the reporter and photographer who meets the ship.

I recall the time the late Huey Long flew to New Orleans just a week before his assassination. Preceded by two husky guards and followed by two more, the stormy petrel of the South stalked into the Eastern Air Lines waiting room.

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I explained to him that my paper insisted on a story and if he refused to talk, I'd just have to write that. I reasoned over the guard's shoulder that

few white men would want to travel afoot.

But Maine's flying warden is entirely accustomed to such a course and carpet. Ned's is a life of forced landings and blind flying. A winged warden simply can't stay with tried and charted routes. You've got thousands of miles of wide open spaces to patrol. You can't depend upon ground landing because there isn't enough cleared space. You've got to use pontoon landing gear in summer and rely on ski landings in winter. Plenty of times you'll find yourself having to circle down 3,000 or 4,000 feet to take a pond or river bend so small that you are lucky to have 15 feet of clear space beyond each wing. Sometimes the water is rough. That means you've got to nose high, and tail to the waves or current. Big metal surfaces of the pontoons sometimes take a terrific beating from the waves.

There's always danger of jetting rocks or logs which can't be seen from the air. If you smash a propeller or log a pontoon it's most definitely too bad. So in flying the big woods you find yourself continually peering for the next and nearest blue lake or ribbon of river. With a sturdy plane there's a chance of getting out alive even if you tangle with the treetops. It isn't a very healthy chance. In winter service, ski landing is a necessary business with plenty of sport thrown in for good measure. Smooth ice or snow isn't always findable. And there's the morning-after job of digging the ski gears out of snow and frozen slush.

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I explained to him that my paper insisted on a story and if he refused to talk, I'd just have to write that. I reasoned over the guard's shoulder that

interviewing celebrities was my business and that I'd be a poor specimen of a reporter if I quit just because he refused me once.

Long looked at me a moment through beetling brows. Then he eyes twinkled and finally his face broke into a grin.

"Okay, boys," he said, "let him through. I guess he's entitled to a break."

He gave me a swell yarn.

For a long time Robert Cuse, head of the Vimalert Co. of Jersey City, which sent the ill-fated *S. S. Mar Cantabrica* to Spain, was the most elusive person known. Reporters haunted his factory for a glimpse of him. None found him. His ships sailed off with loads of aircraft and aircraft supplies, but Cuse was never to be found. Guards patrolled the factory grounds, chasing reporters and photographers at gun points.

One summer day I was lolling about Eastern Air Lines' passenger station, casually looking over the manifest. I saw the name of Robert Cuse, booked as a Washington passenger. I wasn't sure it was the Cuse, because the name is not an unusual one, but I took a chance. I watched until the man checked in. He was tall, heavy-set, with a stubby mustache.

"You're Robert Cuse of the Vimalert Co., aren't you?" I asked.

"Yes," he said, with a slight foreign accent. "Who are you?"

I introduced myself as a reporter and Cuse threw up his hands and guffawed loudly.

"So," he roared (and I mean roared) "you reporter fellers finally found me! And now, so what?"

There were plenty questions to ask and, strangely enough, he answered them cheerfully.

"You are the first newspaper man to talk to me, do you know that?" he said.

"Why have you ducked all reporters so consistently, Mr. Cuse?" I asked, "especially since you have been so free in answering me?"

"I have never ducked them," he chuckled. "I just wasn't there when they were."

Which is a distinction without a difference.

A few years ago Katharine Hepburn made a crazy bet with a photographer that she could cross the country via plane and not have her picture taken. That she lost the bet is a compliment to a Pittsburgh cameraman and a credit to her news sense. She got more publicity that way than if she'd posed willingly.

However, arriving at Newark airport, Katharine hid in the ship after all the passengers had deplaned. When the Douglas taxyed across the field I followed in a car, accompanied by another reporter.

Katharine leaped out of the ship, ran around the rear and ran right into me. Seeing I had no camera, she relaxed a bit and told of the bet. Then, seeing a photographer heading for her, she ducked into Captain Jack Zimmerman's

(*Concluded on page* 83)

Z-z-z-z-z-z-zip!

THIS is such a remarkable, unusual photograph that we just have to pass it on to our readers. It is typical—not of any of we Americans' "superior" air work, but of the imaginative, determined efforts of British aviation photographers. This picture is evidence of the efforts of the Royal Air Force to better acquaint the British public with that organization by *forcing* that public to pay attention out of sheer admiration. Compared to the U. S. Army Corps or the Navy Bureau of Aeronautics, the difference in psychology is the difference between the sea and the desert.

The above photograph was snapped (and he literally had to snap at lightning speed to catch the plane) by a photographer for *Flight*, prominent British aviation magazine. While flying above the clouds in the camera plane, the photographer set to work while a Royal Air Force pilot "posed" the powerful Gloster *Gladiator* biplane fighter in various attitudes and positions. This picture of that pilot's "machine-gunning" zoom (note two machine-gun emplacement bulges on bottom wing) had to be shot in a flash as the ship roared by the camera.

"Salesmanship" photography like the above is one of the main reasons POPULAR AVIATION selects such a large number of British photographs for publication. Although Americans have even better photographic equipment available, such pictures—from either the Army, Navy or commercial organizations—are rare.

Look Out for Gusts!

LIGHTPLANES, because of their low wing-loading, are peculiarly sensitive to high winds and gusts, therefore, a few remarks on the subject by the inspectors of the Aero Insurance Underwriters will be of value to beginners in the lightplane field. The advice to you fellows is:

1. Check the weather and wind forecasts before attempting any cross-country flights. Be a consistent weather map reader.

2. Do not operate in gusty winds or in any wind over 20 m.p.h., unless you have rolled up a considerable number of flying hours.

3. When you see the towering brilliant white peaks of a thunder-head approaching, get your ship under cover before the storm strikes. Violent disturbances frequently take place before the storm is actually overhead or within apparent striking distance.

4. If caught in a bad wind, while in flight, land your plane a little faster than you would in a normal breeze. Keep the tail up as long as possible.

5. If you find taxying difficult, wait for help before attempting to roll the airplane into the hangar. Many a plane and many hangar doors have suffered from the neglect of this precaution.

6. Help keep the insurance rates down by exercising caution and operating lightplanes within their limitations. You are not flying a pursuit ship nor an airliner, but are handling a low-speed ship with limited power and a comparatively small reserve.

7. Beginners can profit by practicing wheel landings in winds with a competent instructor.

Adventure IN 1912

by GEORGE A. STODDARD

Here is flying as it was back in the days of Lincoln Beachey and Otto Brodie. Presenting another first-told story of aviation's weaning.

This unusual photograph shows the author at the controls of Brodie's Farman. Brodie jealously guarded this ship; it was the only one of its kind in the United States.

THE air mail service was begun May 15, 1911, according to postal officials. If the statement is qualified by stressing that the 1918 flight was the first *regular* flight, I won't argue. But Otto W. Brodie flew the first mail in the fall of 1912, six years before James C. Edgerton covered the 218 miles from New York to Washington.

Sure, Brodie's flight wasn't much more than a jaunt across Chicago, less than 25 miles from Clearing field to Argo, Ill. Brodie only flew the route once with mail, but Pathé newsreel will prove it was the *first* air mail flight in the United States! Ask Major R. W. "Shorty" Schroeder; he was at Clearing field as Brodie's mechanic. How do I know? I was taking aviation lessons in 1912!

On July 25, 1911, the aviation bug bit me. I had travelled 210 miles to the annual North Dakota State Fair at Fargo to see Bob St. Henry fly in a heavier-than-air machine. The plane, a Curtiss powered with a 50 h.p., four-cylinder water-cooled motor, had been crated and shipped from Chicago a week before.

St. Henry spent two days assembling the machine at the fair grounds while hundreds of skeptical hicks stood around gawking and asking silly questions. St. Henry merely smiled at the jeers, answered the simple questions whenever possible, and covered the airplane with a tarpaulin to wait for flying weather —which meant perfect weather in 1911.

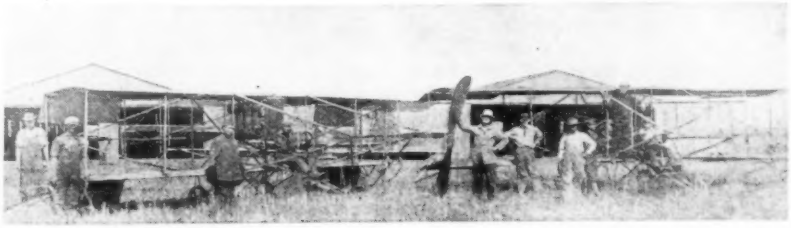
The week was almost gone, and St. Henry's "fool machine" still nestled under the tarp. The crowd became more curious, then more skeptical, then insulting, but Bob St. Henry calmly waited for weather which would allow him to fly without breaking his neck.

About 4 p. m., July 25, the air was so still the hundreds of gaily colored fair banners hung lifeless against their masts. St. Henry wheeled his Curtiss to the center of the one-mile race track, warmed up his 50 horses for almost half an hour—and flew. Not over 600 feet above the stands he churned the air for about four minutes and landed safely on the same field he had left. That same afternoon he dismantled his Curtiss, crated it again, and shipped it to Minneapolis for his next exhibition.

I hadn't believed it was physically possible to make that heavy crate leave the ground. I had watched, as had hundreds of others, only for the chance thrill of seeing him crack up or the enjoyment of jeering when the contraption failed to take-off. That four-minute flight convinced me I would never be satisfied as an Iowa farmer until I had tried this new game.

My dad threatened to disown me, my mother cried that I would be killed, my future wife threatened to "call the whole thing off," but I sold two sows and

(*Continued on page* 86)



Brodie's old ship is at right above. The author is second from the extreme left.

Below is an old Curtiss similar to that on which the author served as a mechanic.

FLYING f

Director Williams (above front, with a student) is determined that his air school plan will result in a group of 75 private pilots being licensed.

GOVERNMENT-IN-BUSINESS bids fair to promote a boom for private enterprise in Tennessee. The "government" is Tennessee's Bureau of Aeronautics; the "business" is aviation and the beneficiaries are the private flying schools.

When Major Walter Williams, Tennessee's dynamic director of aeronautics, first burst upon an incredulous public with his open-to-all air school plan last March its avowed aim was to turn out a class of 75 private pilots. As the first swarm of competing hopefuls complete their ground work this goal appears incidental in the aims of the candidates and the ends gained for aviation.

This first systematic state subsidy for pilot-training—Williams' brain child—is proving more popular in Tennessee than passes to a circus. It pleases the non-flying as well as the flying public and even the taxpayer sees a tangible return on the money taken away from him.

But the free air school program, which puts Tennessee in the front rank of aviation progress among the 48 states, draws its most substantial interest from the operators of private flying schools. At first blush it may look like government competition for them, but they are among its lustiest boosters. This is not without reason. There are some 2,780 students enrolled in the five ground schools located in five of the State's major cities. Roughly, 2,000 of them have continued their ground course to the finishing stage and doubtless most of this number will complete it—even though their grades assure them they will not be among the 15 from each school to receive flying scholarships.

This is no violent assumption. I visited the Nashville school on the night after the mid-term examinations. Although low grades had been pretty general, according to the instructor—and the night was a rainy one—some 450 were present. There was no lack of interest. I talked to a dozen or more at random, asking them what they were getting from the course, how they expected to use it and if they had hope for a scholarship. Of course hope is a hardy and universal human weakness and only a few of them eliminated all possibility of the scholarship, but all of them were enthusiastic about learning to fly.

Here is a sample. Dr. Walter Lott, a physician of 44, said, "If I don't get one of the scholarships—and my failure wouldn't surprise me—I hope to organize a flying club from among others in the same boat. We can buy an inexpensive lightplane and hire an instructor and learn to fly anyhow—that's my idea about it."

At least one student, Philip Duke, hasn't been able to wait. He said he plans to "buy some time" now that he has learned the theory of flight and expects to buy a plane after he has soloed.

Mai Ellen and Mary Helen Gray, twins of 18, without being greedy, hope to land two of the three flying scholarships reserved at each school for women, but they are sure they "will go on with flying" even if they fail of this mark.

And then there is the United States District Attorney at the Knoxville school. He doesn't count his odds for

Below is a representative group of people who are attending Tennessee's novel school. The book being passed out is "Your Wings" by Assen Jordanoff, a standard school text.

for NOTHING

by BRAINARD CHENEY

When the government of any given state decides to donate aviation instruction and flying time, that's news. Not only that, Tennessee bought five new airplanes with which to give instruction — free!

Major Walter Williams

a scholarship a safe bet, but he explained, "I am getting a great deal out of this course, anyhow. Here is my angle. There is not a lawyer at the Knoxville bar who knows enough about aviation to intelligently examine witnesses in a case growing out of aviation, say an air accident involving crime.

"If I had a pilot on the stand charged with manslaughter growing out of some aviation mishap, I wouldn't know how to intelligently cross-examine him—or at least I wouldn't have, before I took this course."

And for determination you can't beat Jack Shea, member of the same class, who broke his arm but, undaunted, turned up for the written test with his mother to handle the pencil. He dictated his answers to the questions and she wrote them down. But that isn't all to that story. After attending three meetings in a stenographic capacity, Mrs. Shea became so "souped-up" in the aeronautical swing she begged to be allowed to join—and she is still attending classes.

Some of the aviation addicts travel as far as 75 miles to attend the schools, for while they are located in only five cities no resident of the State was barred. Twice weekly three engineers from Copperhill drive the 75 miles to Chattanooga to attend the ground school there.

Most of the schools draw students from a radius of 50 miles around. Joe McClain, one of the Memphis school aeromaniacs, tells the state bureau by air mail that he can't wait for a scholarship but is going to "buy time" immediately.

This ground school course to which the people's proteges in Tennessee are being exposed is no stage money—it is legal tender. *Your Wings,* by Assen Jordanoff, and *Ground School Text Nomenclature,* compiled by Director Williams and Assistant Director Haywood Norman, are used as texts. A qualified instructor from a local private flying school in each city has been employed as the regular class pedagog, but visiting lecturers and special lecturers in such subjects as navigation and meterology have been drawn in. And Jim Kukla, a seasoned air school manager who was given three months leave of absence from the aircraft manufacturing concern with which he is employed for the purpose, has been employed as coordinator for the whole school system.

Projection slides and motion pictures are also being used to clarify and pictorialize much of the mechanical subject matter. Engine structure, airplane structure and appliances and the like are illustrated in slides and films.

Just to give them an actual grip of the stick, Major Williams is now providing an instructional "hop" for each student who wants it before the ground school closes. Already some 500 at the Nashville school have been taken up and allowed to skid a training plane around the sky on the basis of their "book

Below are the five brand-new Piper Cubs recently delivered to the Tennessee school. Despite the fact that these ships had to be bought, the entire project has only cost a modest sum ($16,000 to date).

larnin'". The same taste of real flying is being served to order in the other four schools, also.

This may not teach any of them much about flying a plane—it is only intended as a demonstration of theory—but it is almost certain to whet appetites not to be satisfied under several hours of subsequent "dual" from private instructors.

Recently, Spurgeon Van Deren, a private school student pilot who has been listening in on the lectures, passed his examination in meterology for his transport license through instruction he received in the Nashville school.

There are more than 500 students in each school competing for the 75 state-paid passes to pilothood. Each hopeful has a legal right to his fair chance at it. Major Williams has said, "There will be no politics and on favorites in awarding these scholarships," and he is taking every precaution to see that this promise is no bromide.

In each school the following system of grading is applied. At the beginning of each lecture a written test is given over the matter covered in the last. A list often statements on mimeographed sheets passed out to the students, is presented. Each is to be checked for its correctness or falseness.

If the student checks it wrong the count against him is 20, or double, to eliminate (or discourage) guessing. If he leaves it unchecked, the count against him is ten. The statements correctly checked, of course, count ten for him.

Just as in another state institution where entrance is not so eager, the pilot candidates are reduced to the anonymity of a number. At the conclusion of the test period the student puts his number at the top of his test paper—no names allowed—and passes it down to the instructor on the platform. The papers are then redistributed and as the instructor reads out the statements and states whether they are true or false, each student grades the unidentified paper in his hand. The grades thus arrived at go on registration cards bearing corresponding numbers.

In addition to this lecture period grade, the student receives a grade on a final examination given at the completion of each subject and another given at the end of the whole course.

These meter readings determine each contender's attitude. Scholarships are to be awarded strictly on this basis, with one exception. In addition to his ground school standing, the student, if selected, must pass the Bureau of Air Commerce physical examination for student pilots. If he fails in this, he is eliminated and a student having the next highest average will be given a chance.

Being free and state-operated, the schools maintain but one entrance requirement—a minimum age limit. This limit is fixed at 16, since that is the minimum age at which the federal bureau will issue a pilot's license. And the classrooms have the texture of true democracy. A breakdown of the Nashville school, for example, shows ages from 16 to 60 years. The total enrollment of something more than 600 includes some 50 girls and women.

Among occupations, the largest number are listed as students. This number—122—includes, of course, high school as well as college students. But there are 66 clerks of various types, 11 factory workers, 32 salesmen, 18 mechanics, 22 bookkeepers, 18 engineers, etc. The range of occupation includes dancers, housewives (of which there are a dozen), newspapermen, airline employes, bankers, insurance agents, shoemakers, lawyers, waiters, executives, commercial artists, mailmen, nurses, an undertaker, an hotel manager, draftsmen, stonecutters, railroad firemen, court reporters—indeed, there are few, if any, conceivable occupations left unnamed in the registration list of this student body.

If the free schools in Tennessee provide any answer to the question, "Who is interested in aviation?" that retort is: "A cross-cut of we, the people".

There have been one or two previous stabs at free state flying schools, but the Tennessee experiment is the first serious and systematic effort that has come to the attention of this writer. Credit for the experiment falls properly to Walter Williams, Tennessee's irrepressible aviation enthusiast. A veteran pilot of almost 20 years' experience, Williams is not only active head of the state bureau, but is commanding officer of Tennessee's National Guard squadron and N. A. A. governor for the State. And not to be overlooked: he enjoys the solid support of a loyal and sympathetic state commission, composed of three prominent laymen, Will T. Cheek of Nashville, W. Percy McDonald of Memphis and Mayor Marion Sell of Johnson City.

In the past aviation directors in Tennessee have been timid. Among the other rather self-important heads of government departments they have been only tolerated. To Williams, aviation is the biggest thing going and he doesn't permit anybody to "only tolerate" his bureau. He conceived his school system and when he found there was money enough to make it go, he "jazzed the motor and took off."

Briefly, the epoch-making program is this. Five ground schools were established in the cities where the five major airports in Tennessee's modern chain of flying fields are located. These are Nashville, Memphis, Chattanooga, Knoxville and the Tri-City Airport serving Bristol, Kingsport and Johnson City.

Under the original plan, each ground school was to accommodate 500 students —a total of 2,500. But on the morning enrollment began, a stampede of applicants swept each recruiting office. In 36 hours the classes were over-subscribed, with a grand total of 2,780 enrolled. And the registrars had to hastily hang out the "Quota Filled" sign and duck out the back door to escape the disappointed applicants. Even Williams was startled by the enthusiastic reception his schools received.

The ground schools cover a three-months course. Classes meet on two nights each week. The principal subjects taught are aerodynamics, theory of flight, airplane structures and rigging, engines and accessories, meterology, navigation and the Civil Air Regulations. The ground school course ended June 15, when the first classes of embryo pilots was released. The 15 fortunate in each school who achieved flying scholarships began their flying training on July 1. They are to receive 50 hours of free dual and solo flying.

The enterprise is not proving costly. Although five new training planes had to be bought to initiate flight instruction, the whole bill will not run much beyond $16,000.

Director Williams regards this year's schedule as only a beginning of his program. He hopes, later, to extend his state flying schools to smaller cities. He plans, also, to provide a Link Trainer for more advanced blind and instrument

(*Continued on page 66*)

Students in Tennessee's free aviation school include dancers, housewives, newspapermen, bankers, insurance agents, artists and nurses. Below is a typical classroom.

J. F. COOPER

THE BLIMP TAILOR

by HELEN WATERHOUSE

If you have been wondering who's responsible for all the sewing on balloons, your search is over. The gentleman's name is Cooper and the address is Akron.

THE United States Army is watching with interest these days the performance of some new C-6 motorized type balloons in the hope that they will answer the need for an aircraft that can stand stock still overhead, yet run away at the approach of an enemy.

But behind the scenes the builder of these balloons—called the "world's greatest balloon tailor"—marks these bags down on his list as just one more problem solved, just one more phase of his day's work.

He is J. F. Cooper, of Akron, Ohio, a rough-and-ready type of man, known as "Coop" to his hundreds of friends. In "Coop's" long career in the designing and shaping of all types of balloons, he has built more than 1,000 of the curious shaped kite and sausage bags—those famed "elephants" or capive balloons which were used during the World War for observation purposes, and which became the subject of many a humorous war story.

He has made the outer covering for an entire fleet of Goodyear blimps, for many a racing balloon, and for the two great airships, the *Akron* and the *Macon*.

The huge gas cells for the *Akron* and *Macon*, as well as for the earlier *Shenandoah*, with replacement cells for the *Los Angeles*, were built in his workshop at the Goodyear company. Even the cigar-shaped kite and sausage bags—those dred Army and Navy blimps are his "babies."

A more intricate job which "Coop" has tackled in recent years has been the construction of great grotesque figures for the Macy parades, which are a feature of New York's Thanksgiving celebration each year. Cooper designed all the figures himself, using Tony Sarg's famous drawings instead of blue prints. One would find him up in the Goodyear balloon room, cutting out a pattern for Pinocchio's nose, 12 feet long, or some similar enormous feature of his animals or giants.

Cooper's triumph of triumphs, however, was the building of the stratosphere balloon *Explorer II* for the National Geographic Society-Army Air Corps flight in November, 1935, when two Army officers soared to a distance of 72,395 feet. This was the world's largest balloon—of 3,700,000 cubic foot capacity.

"Coop's" ingenuity and resourcefulness in building, rigging and inflating the great balloon, and in repairing it at Rapid City, S. D., after what appeared to be a disaster at the outset of the flight, recently won him an outstanding award.

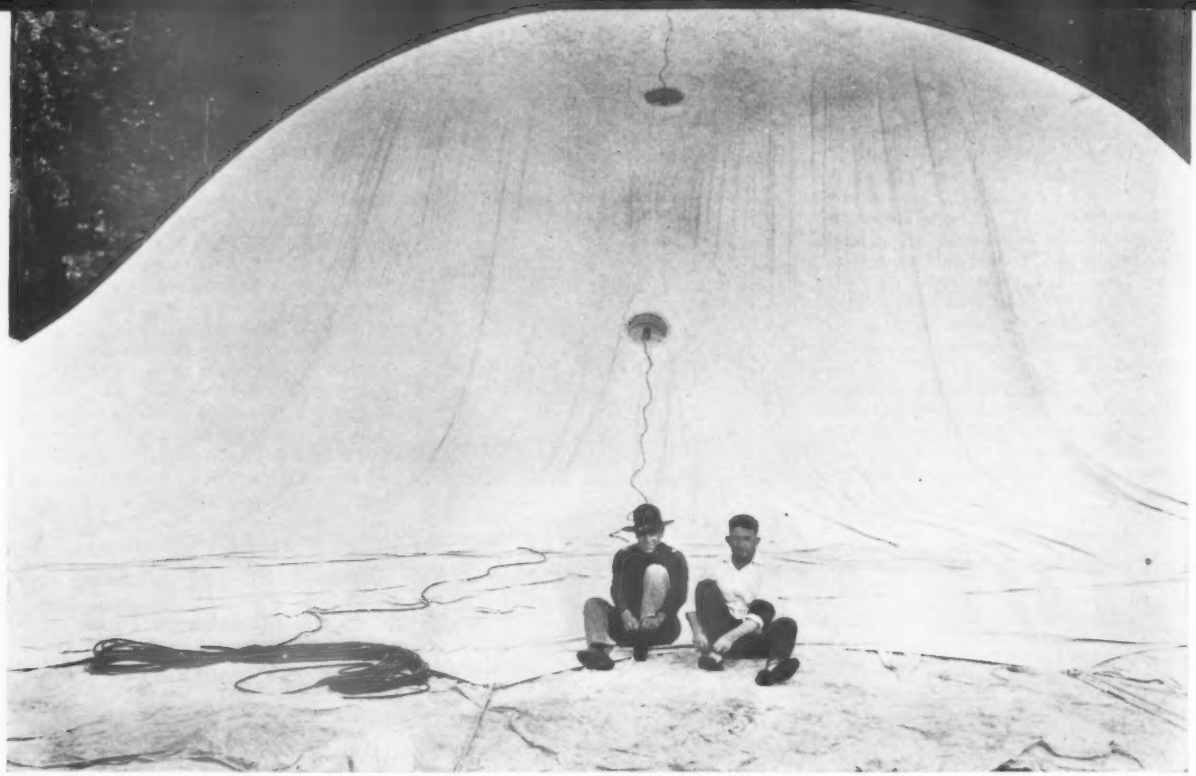
In the presence of Major A. W. Stevens who commanded that Army-National Geographic Society expedition into the stratosphere, and of Major-General Oscar Westover, chief of the Army Air Corps, the modest Akronite was given the special trophy which has been presented but three times before in the history of the Goodyear tire and dirigible company. Akron aviation leaders as well as the Goodyear president after whom the award is named, watched the simple ceremony.

The trophy was presented once to Carl Wellam, outstanding free balloon racer, once to S. A. Steese, for development of a new tire fabric, and once, posthumously to Charles Brannigan, blimp pilot, who was killed when his blimp was wrecked over Kansas City.

The story was related at this ceremony of how the shock-haired rugged balloon tailor saved the day for the stratosphere hop when a burst in the balloon fabric occurred during its final inflation. After many weeks of weary waiting it seems weather experts had decided conditions were right for Major A. W. Stevens and his co-pilot, Major Orvil Anderson, to go aloft. Up to the hour of inflation the balloon had been kept in a tent warmed by an oil stove. But inflation had to be done out of

There was plenty of detailed work to be done on the "Explorer II" on the base of the flight's operations base at Rapid City, S. D.

"Coop's" ingenuity in building, rigging and inflating the 'Explorer II' at Rapid City recently won him a high award.



This was the world's largest balloon—of 3,700,000 cubic feet capacity. The big bag is shown above, partially inflated. Cooper is on the right; Major Orvil Anderson, Major Steven's co-pilot, left.

doors and the thermometer suddenly dropped to zero,

"When the great bag was about one-tenth full, a ripping noise was heard, indicating that a burst in the fabric had taken place," related one of the National Geographic men. Inspection showed a tear in the bag, 17 feet long. Sections of the cloth had frozen together in the sub-zero temperature and pressure of the gas had ripped it open."

But Cooper's resourcefulness was equal to the emergency. Hastily rigging up a tent, and held aloft by soldiers, he patched up the hole and cemented it securely. Then away the *Explorer II* went on its flight into the upper regions, after only a short delay.

While Cooper is noted as the champion balloon "tailor," he also has an unusual record as a balloon pilot. He is one of the few men in the world who was ever struck by lightning and lived to tell the tale. He is certainly the only man to have been struck by lightning 8,700 feet above the ground.

This experience, one of the most thrilling tales in American ballooning, occurred during the National Balloon race out of Pittsburgh in 1928, when the contestants found themselves in the midst of a violent electrical storm in which three of the balloons were struck by lightning.

"Racing balloons have a fish cord netting which completely covers the bag and carries the weight of the balloon basket where the pilots ride," Cooper tells the tale. "I had tried the experiment, in that particular race, of fastening the net firmly to the bolloon.

"One bolt of lightning struck my flashlight, passed diagonally through my body, and set fire to the balloon causing an explosion of the hydrogen gas which blew the top out of the bag.

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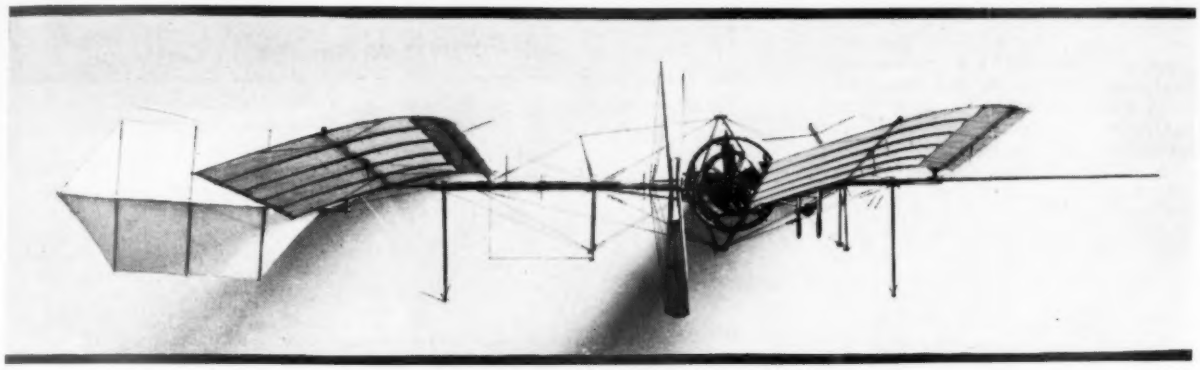
Inflation of the "Explorer II" had to be slow—and very careful. Naturally, because of the balloon's size, all work was done outdoors.

When the huge National Geographic-Army balloon suddenly burst during inflation. Cooper's patching saved the day.



This is Langley's gas model as it hangs in the National Museum today. Note the engine mounting.

THE FIRST GAS MODEL

by N. H. RANDERS-PEHRSON

Here is proof that there's nothing new about the gas model airplane. This one was flown back in 1903.

WHAT did Langley do? Put this question to any group of aviation people and the chances are that nine out of every ten will tell you that he built an airplane that fell into the Potomac. Some think it was capable of flight and some deny it. There may be contention over the Hammondsport trials and the Wright machine in Kensington Museum. Meanwhile the original question: What did Langley do? will be completely forgotten. Now this is not quite fair to Langley, because his claim to a place among the outstanding pioneers of aviation does not depend on whether or not his large machine could fly.

Langley's greatest achievement in practical aviation experiment was the building the first model airplane in the world to make long flights under its own power, and next the building and flying of the world's first gasoline driven model.

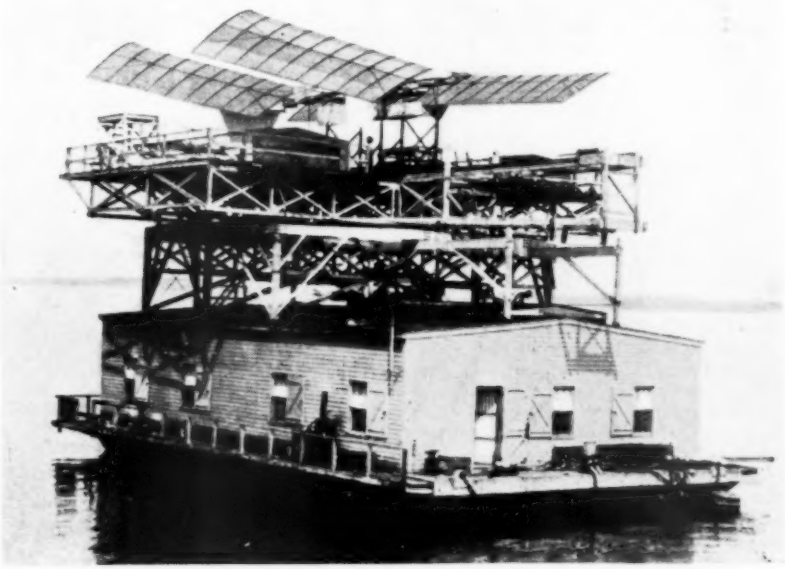
Langley's steam-powered "Aerodrome No. 5" was catapulted from the top of a houseboat on the Potomac River on May 6, 1896. It flew for a minute and a half, covering more than half a mile. On later trials, with the same machine, and with another one like it, the performance was repeated and even bettered. The distance record until then stood at 368 feet, flown by one of Lawrence Hargrave's compressed air models in 1890, and the duration record was 23 seconds, also held by a Hargrave model. Hargrave used flapping wings to propel his models; the best that had been achieved by screw propellers was 120 feet in about 20 seconds, by Pénaud in 1870. Aerodrome No. 5 weighed nearly 30 pounds complete, with steam engine and boiler. That is, it was heavier than any living flying creature and much heavier than any model that had ever before made free sustained flight. Previous model builders had utilized rubber cord, compressed air or some other means for storing power. Only John Stringfellow, in 1848, had succeeded in making a steam-powered model fly very short distance. Langley's model surpassed all its predecessors by such a wide margin that the date of the flight marks an epoch in aviation history and May 6 is still celebrated as "Langley Day."

Alexander Graham Bell who witnessed the flight sent a report to the scientific journals and he stated that "no one who was present on this interesting occasion could have failed to recognize that the practicability of mechanical flight had been demonstrated."

If Langley had quit aviation at this point, which was his original intention, his name would still be one of the greatest in the history of aviation. His subsequent attempt to build a man-carrying airplane ended in bitter disappointment when the launching apparatus fouled and lack of funds prevented a further trial of the machine.

In the storm of unjust criticism and all the controversy that arose over the failure of the large aerodrome, another outstanding accomplishment was practically forgotten. This was the first successful gasoline-powered airplane model in the world.

By the flights of the steam aerodromes Langley had furnished conclusive proof that mechanical flight was possible, and he intended to leave the further development to others. Yet, the desire to take the final step, to put a man-carrying machine in the air, became too strong. Encouraged by President McKinley and with $50,000 supplied by the Board of Ordnance and Fortification of the War



Langley's famous "aerodrome" (above) was a large-sized version of his more successful gas model. He abandoned developments of the model in preference to the big ship.

Department, he began work on a full size machine. The work on the aerodrome got under way in the Smithsonian shops, but contract for the engine was let to a manufacturer. A large house boat with a catapult from which the aerodrome could be launched was also built. While all this was in progress flight tests were made with the steam aerodromes and these gave useful data.

There were, however, many differences between these and the large aerodrome; therefore Langley decided to build an exact replica of the large machine, one quarter size, which could be tested as a final check, to make sure especially that the balancing was right before any man should risk a take-off in the large machine. The engine was ordered from the builder who was working on the large engine. After long delays he proved unable to meet specifications in either contract, and Langley's able assistant Charles M. Manly undertook to build the engines in the Smithsonian shops.

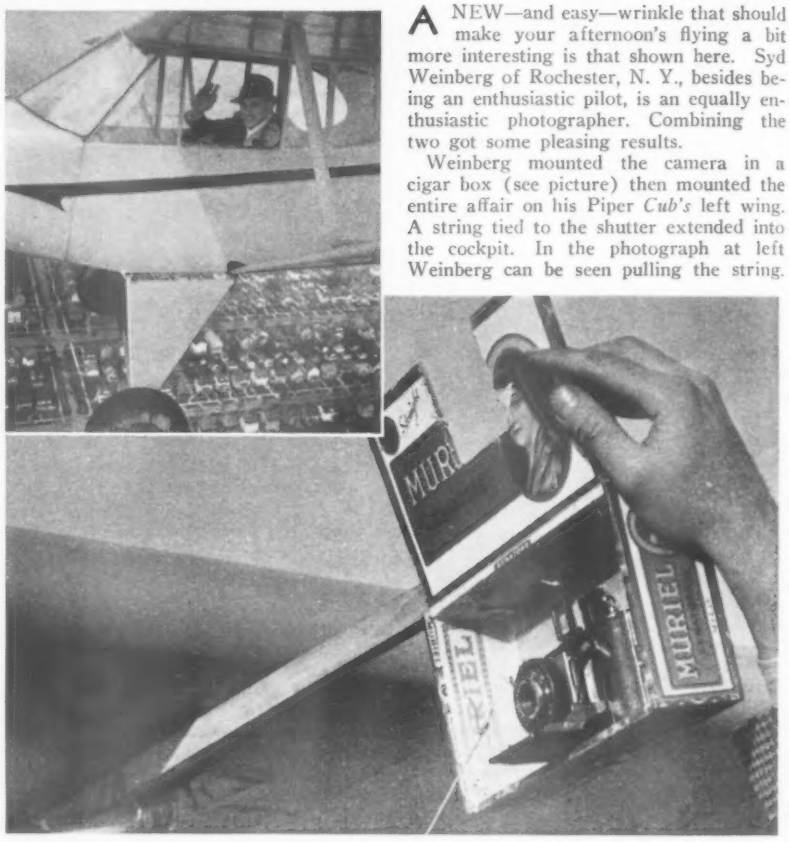
The large engine was, of course, the more important; it succeeded, and was the finest aviation engine built up to then, remaining unsurpassed for several years. But the small engine is the one that concerns us now, the first successful gas-model airplane engine in the world. Manly first tried to make it an air-cooled rotary, a type which did not come into use until 1909. Parts from the unfinished engine made by the contractor were used and in a short time Manly had his rotary engine ready for power tests. The engine would run, but there were such great fluctuations in speed during each revolution that no brake test could be made. To make the engine run more evenly, flywheels were added, but now the strain on starting the crankshaft in starting was so great that it was found unsafe to use flywheels. Finally the engine was reconstructed with stationary cylinders. When completed it would give 1½ to 2 h.p. but it could not maintain this power for more than 30 seconds because of overheating.

In the meantime the quarter-size aerodrome had been finished, and also the house boat with the catapult, and Langley decided to make a test, hoping that a fair flight might be obtained before the cylinders got too hot. In June, 1901, the gas model was taken down the Potomac to Widewater, where the house boat was anchored in the middle of the river. On June 18 the first flight test was made. The catapult worked perfectly, the model started off and flew straight ahead for about 100 feet, then it began to sink, landing on the water 150 feet from the house boat. It was in the air only four to five seconds.

It was picked up undamaged and launched again as soon as the wings had dried. This time it went 300 feet before descending, and landed 350 feet from the boat after 10 seconds in the air. These two test flights were really the first ones with a gas model, but they are rarely mentioned because they were so very short. Yet, they did demonstrate the balance of the aerodrome.

(*Concluded on page* 64)

Self-Portrait on the Wing



A NEW—and easy—wrinkle that should make your afternoon's flying a bit more interesting is that shown here. Syd Weinberg of Rochester, N. Y., besides being an enthusiastic pilot, is an equally enthusiastic photographer. Combining the two got some pleasing results.

Weinberg mounted the camera in a cigar box (see picture) then mounted the entire affair on his Piper *Cub's* left wing. A string tied to the shutter extended into the cockpit. In the photograph at left Weinberg can be seen pulling the string.

A Close One!

THIS is not a war story, although it happened during the World War and in France, while on war service. The case being so extraordinary I will give exact details so that any incredulous reader can investigate it for himself.

I was a Flying Officer Observer with the 49th (Bombing) Squadron, then flying D.H.9's with B.H.P. engines, and attached to what was known as the "Mobile Wing".

Our duties in 1918 took us, in June, to Beauvais to help French stem the big German push on the Aisne—in July—to the Marne to coöperate with the French and Americans in what turned out a debacle for our then enemies. August saw us back on what we called our "home" front—the Somme—ready to participate in the great August 8th push which ended in the armistice of November, 1918.

The event I record happened toward the end of August. Our aerodrome stood in a trampled cornfield near the little village of Beauvais, and on the main road between Hesdin and St. Pol. The men's camp was scattered around wherever kindly trees lent protection or where still-standing corn offered a good camouflage harmony.

The officers' quarters were located some distance down the road and well away from the 'drome in an orchard where the close-growing fruit-trees effectively hid the tents from the prying eyes and lenses of reconnoitering enemy aircraft. It had a wayside shrine of the Madonna and Child presiding over the entrance.

One afternoon—an ideal August afternoon in Picardy—I was told off on special duty with a new pilot. It was either to show him the lines or take him over the ground-target for machine-gun practice, I cannot now remember exactly. Our outward journey and duty was completed without untoward incident. On the return journey and right over the 'drome, the thing happened—all in a few flicks of an eyelid.

As I mentioned before, the 'drome lay in a trampled cornfield. Southeast of the field stood a clump of dense woods with a small lake or pond on its westerly side. We were spiraling down over the 'drome, losing height preparatory to gliding in. The wind was from the west and, when the altimeter touched 300 feet, we took a long sweep towards the south, circling east over the woods ultimately

(*Concluded on page* 77)

The MAN UNDER THE HOOD

By D. W. W.

EDITOR'S NOTE: We have had several complaints from persons and organizations dealt with from time to time in this column in connection with the anonymity of "The Man Under the Hood". We have repeatedly pointed out that, "for obvious reasons" this columnist's true name must be kept secret. For those unable to comprehend "obvious reasons" we might point out that we are in the same position as the aircraft manufacturer who is forced to withhold the name of a particularly good customer, much as he would like to yell that name publicly. Like the manufacturer, we are forced—much as we ourselves dislike it—to keep our professional mouths shut. "The Man Under the Hood" is employed by a reputable, nationally-known organization. His contract with that organization automatically precludes his writing such a column openly.

THE inside story of the **DC-4** is that it is a wonder airplane. . . . It has surpassed in every detail the performance figures forecast for it by **Douglas** engineers. . . . It will cruise about 215 m.p.h. at 62.5 percent power instead of the 198 of the estimates. . . . It's climb is better and its load-carrying capacity may be far beyond expectations.

* * *

There was a story going around recently among pilots of one of the big transcontinental airlines, now in California to watch the tests of the **DC-4,** telling how—supposedly—the big plane missed what might have been a serious accident during its second flight by a narrow margin:

Carl Cover and **Johnny Cable** of the **Douglas** company (the story went) took the big plane off Clover field in fine style and they cruised it around a while. . . . Then they were supposed to have gone over to **Burbank,** with its perfect approaches and long, smooth concrete runways, for that first landing. . . . All went well and everybody was pleased as punch. . . . Then the two pilots prepared to take off and go back to the **Douglas** plant. . . . The motors were started and, just at the last moment, a humble mechanic checked the fuel tanks. . . . He found (our informants insist) that there were only 25 gallons left . . . This would have been just enough to get the airplane well away from **Burbank** before the four *Twin Row Hornets* quit. . . . If true, it may have meant the loss of the plane, for those four engines burn about 220 gallons an hour at cruising speed. . . . Personally, we can't see how such a thing could have happened. . . . **Carl Cover,** when queried, wired: WE DID FLY OVER BURBANK ON INITIAL TAKE-OFF BUT HAD NO INTENTION AND DID NOT LAND THERE AT ALL. ORIGINAL PLANS WERE TO LAND AT MUNICIPAL AIRPORT WHERE WE DID. NO TRUTH TO STORY DC-FOUR IN DANGER FROM GASOLINE SHORTAGE. ONE TANK WAS INTENTIONALLY PERMITTED TO RUN LOW FOR CONSUMPTION CHECK. PLENTY OF GASOLINE WAS LEFT WHEN DAY'S FLYING FINISHED.

* * *

I want to register a protest against the trend as evidenced in the new airplanes that are being test flown by the light airplane manufacturers at this time. . . . That trend is toward higher horsepower engines and higher performance—those items are fine—but it also is toward higher initial cost and that is dead wrong in my estimation. . . . I say that because the **Piper** people who now put out the **Cub** are experimenting with a two-place side-by-side cabin job that will probably be underpowered with its 50 h.p. engine. . . . They know they need one of 65 or 70 h.p. for the job and they probably are going to have to go to something in that class.

You have to pay for horsepower somehow. . . . Generally it's in cash. . . . And the boys who are flying the light stuff today simply do not have the cash to invest in heavy planes.

Nevertheless, do not be surprised if, by the time you read this, certain prominent "small-engine" manufacturers have announced they are offering for sale 75 h.p. engines. . . . One of the leaders is just about to do so, merely by stepping up the revs on their 50 h.p. job which has 144 cubic inch displacement. . . . Another company is going to gear its "50" and turn it up higher also.

* * *

American Airlines is much interested in the new twin-engined "stratoliner" that the **Curtiss** airplane company of St. Louis is going to build. . . . The slogan for that job is "twin-engined economy—and safety—with four-engined efficiency." . . . And they may really have something there, because the big worry of the airline operators today is: "How are we going to get loads for our big planes?" . . . at least **American** has sent some of its operations and engineering people down to look over the mockup in the **St. Louis** plant. . . . Remember that **American** has not bought any of the **Boeing 307s** and **C. R. Smith,** the company's president, is a hard-headed young man who insists that his company fly airplanes that are money-makers.

* * *

Glenn Martin, after building the **Pan American** clippers now used on the Pacific, swore he'd never do business with that company again. . . . And it looks now as though **Boeing** of Seattle was getting the same sort of headache that **Martin** experienced. . . . For one thing they are going to re-design the tail group of the big "314" clipper and, instead of a single fin and rudder, they will give it a variation of the **Lockheed** twin fin and rudder. . . . Another item is the re-designing and replacing of the water-wings that give the *Atlantic Clipper* stability on the water. . . . The trouble was that the big boat was not stable in its lightly-loaded condition. . . . It dipped its water-tight wing tip in the water several times when Eddie Allen tried to maneuver it at slow speeds on the water. . . . It's being whispered that **Boeing** may lose a shirt, as we suggested a month ago, in getting that contract out. . . . A Boeing official, however, had this to say: "There is no feeling that Pan American (Airways) is in any way responsible for the possible losses on the Clipper project. As was brought out in the Boeing Company's annual financial statement at the end of the year 1937, the reason for possible losses on the project is that the contract was signed in July, 1936, and between that time and the present, it became necessary to increased factory wages beyond any point that was contemplated at the time the contract was signed, thus increasing production costs. This is the major item; the cost of current adjustments on the first of the six Clippers during the present test and adjustment program is minor—is part of the business of turning out a new plane such as this which, after all, is the largest airplane ever built in America. . . ."

* * *

From **England** comes a little more information about the new fighters the German air force is getting. . . . The **Messerschmitt** of which we spoke a month ago—the one that was supposed to do 443 m.p.h. at 16,000 feet—is a

twin-engined job, much like our own **Bell** *Airacuda*. . . . So far as I know it is not a pusher, but you might remember that the federal Department of Justice exposed a German spy ring in the east recently and that the informations these spies were supposed to have procured related to our own new Army aircraft. . . . It's a justifiable guess that the Germans are not far behind us on that twin-engined pusher-fighter stuff. . . . The engines in the **Messerschmitt** are supposed to be Mercedes-Benz 1,340 h.p. liquid-cooled inline motors.

* * *

Down at **Akron** recently there was a sorry spectacle. . . . The **Intercollegiate Flying Association**, holding its annual meet, nearly exploded from internal heat. . . . Only a few of the calmer members prevented the competition from breaking up on the "I'll take my dolls (in this case it was *Cubs*, Taylorcrafts or Aeroncas) and go home," note. . . . It seems that some of the tony youths from the effete eastern schools and also from **Kenyon College** didn't like the "tone" of the entertainment offered them. . . . One group of protestants walked off the floor at a dance leaving some of **Akron's** buds, summoned for their entertainment, standing without partners. . . . Veddy, veddy, unsporting. . . . We hear that the association may never have another meet.

* * *

The story on **Northwest Airlines'** most recent crash at Billings, Montana—it was a **Lockheed "14"**—is supposed to be as follows: the pilots took off the field, which is 3,565 feet above sea level, either with the propellers in high pitch, or with the mixture controls leaned out for cruising and not in the full rich take-off position. . . . Naturally, the engines didn't deliver their full 850 h.p. . . . We were told they only turned out about 525 each. . . . And so the ship mushed into the ground 1,000 feet from the end of the runway.

* * *

Lockheed has been keeping very quiet about a new **Army** stratosphere job they are building out in **Burbank.** . . . It's built around the "14" design. . . . The engines will be a pair of the new **Allison** 2,000 h.p. jobs. . . . They'll deliver that only for take-off. . . . Thereafter a maximum of 1,800, and 1,500 h.p for cruising. . . . Speed is supposed to be 480 m.p.h. with cruising at 360 at 35,000 feet and 4,000 miles range! . . . Frankly, we're a bit flabbergasted by these big figures.

* * *

That flying club program we mentioned two months ago has been delayed. . . . It may come through yet, although the men most interested in it have shied away because they're afraid times are not yet prosperous enough to insure widespread interest in clubs. . . . The delay is purely a questions of doubt that sufficient funds can be found to get the plan going.

* * *

We just got the figures on the Ninth Annual Soaring contest at **Elmira, N. Y.**

(*Continued on page* 79)

This Plane Gets Rubber Boots

More than 100 take-offs and landings have been made with these novel floats under many conditions. Capt. Ashley McKinley, inventor, is shown above with his test ship.

PERHAPS Captain Ashley C. McKinley, an officer on the first Byrd Antarctic Expedition, has found the answer to expensive pontoons for aircraft. Captain McKinley and Mike Thorne, his test pilot, recently conducted extensive tests on the novel pair of pontoons shown here. They are entirely of rubberized airship fabric and inflated in the same manner as an automobile tire.

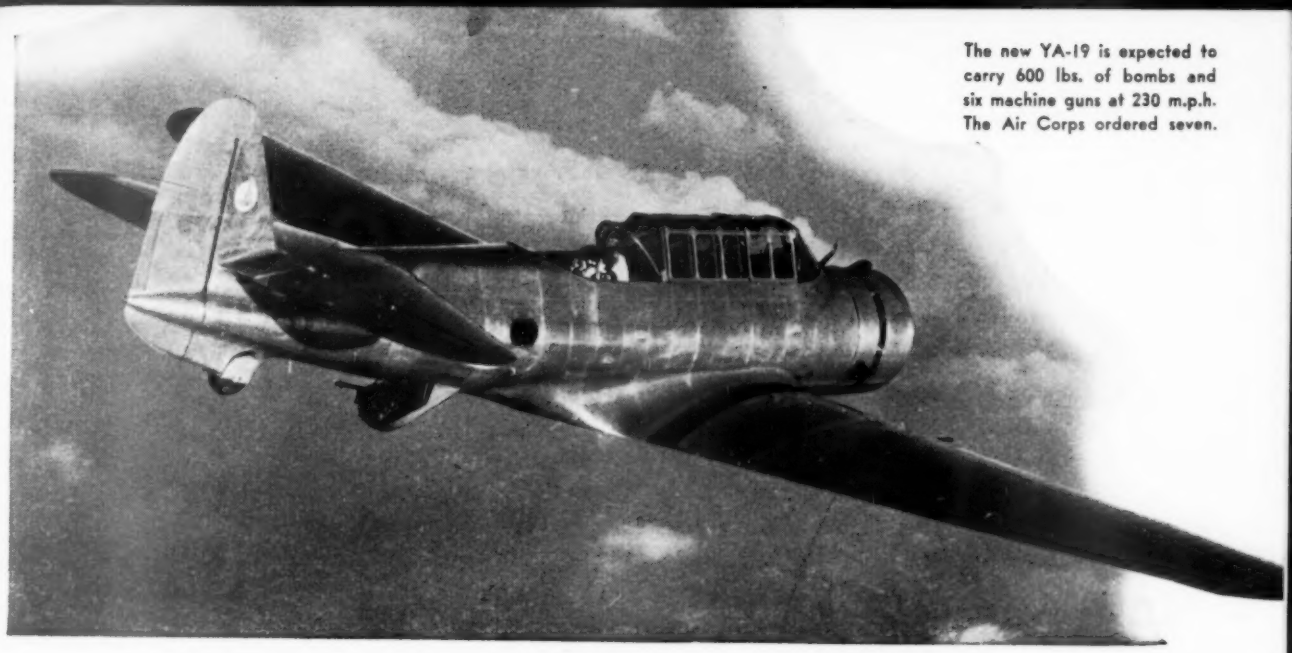
Aviation's first pneumatic pontoons have five watertight compartments in each float. They are inflated at three pounds of air pressure per square inch. The new floats are half the weight of the expensive metal pontoons now in standard use. In addition, they are naturally impervious to rust and corrosion. Because of their great resiliency, they can collide with a floating object that endanger metal floats without damage. In other words, the rubber pontoons act as their own bumpers.

Aviation enthusiasts were interested onlookers at the recent test "flights" of the rubber floats on Long Island Sound. To seaplane owners it was a novelty to watch the easy bumping of the *Cub* test plane as the floats took up most of the shock themselves.

If Captain McKinley's invention goes on the market, they will be constructed of standard Goodyear airship fabric. This material is tough, waterproof and nonleakable. In case of a puncture, the hole can be easily cemented. There is no metal in the rubber floats with the exception of the float struts and the tubing to which they are attached.

Present plans call for further experimentation under actual conditions. The pontoons then will be returned to the Goodyear company at Akron for minor changes and perfections after which McKinley will go after an Approved Type Certificate from the Bureau of Air Commerce. If this is obtained, the novel landing gear can be placed on the open market. Working with McKinley are Thorne, J. F. Cooper, Goodyear blimp expert; and John Klein, former Army mechanic.

The rubber floats act as their own bumpers and have proved themselves capable of colliding with driftwood, buoys or other obstacles without damage to the airplane.



The new YA-19 is expected to carry 600 lbs. of bombs and six machine guns at 230 m.p.h. The Air Corps ordered seven.

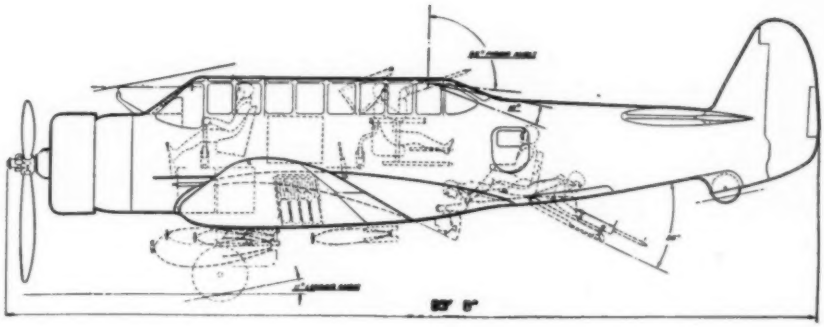
VULTEES FOR THE AIR CORPS

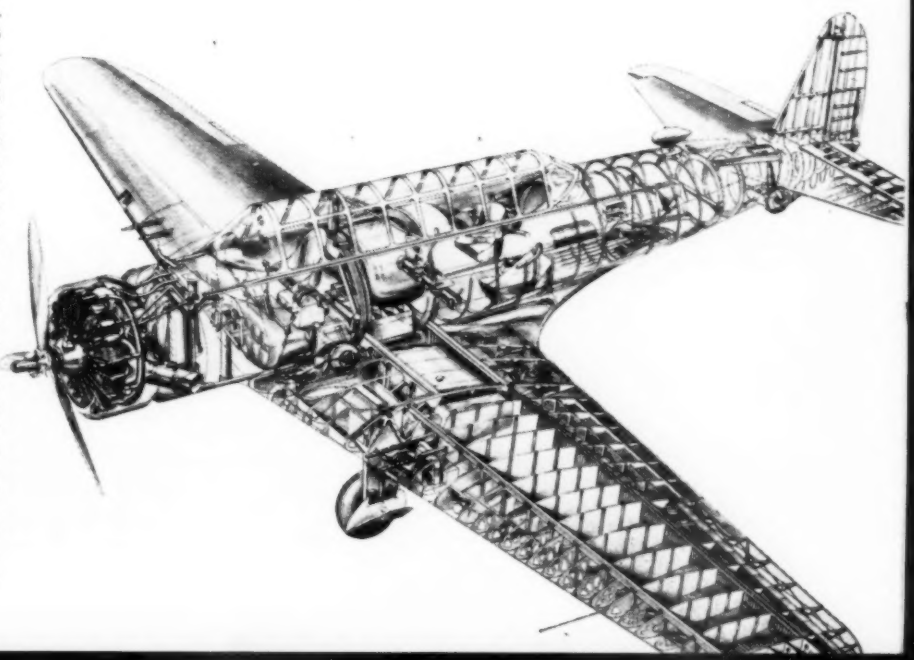
Many brows wrinkled when it was announced recently that the Army had ordered a batch of Vultee attack planes. Mainly because that model is at least three years old and has been exported almost that long.

IF the ship shown on this page is the same model the Army Air Corps recently placed an order for, speculators in the American aviation industry really have something to speculate abo *. Because, if such is the case, the Army has just allotted some $297,180 for an airplane that basically is about three years old. Not only that; the Army is buying an airplane that has been exported to several foreign nations, including Turkey and China.

Be that as it may, the fact remains that the Army Air Corps soon will have seven Vultee YA-19 attack planes. According to Army officers, the YA-19 stacks up fairly closely with the standard Vultee export job. The Army job, however, will be powered with a 14-cylinder Pratt & Whitney *Twin Wasp* engine which will boost the ship's speed up to close to 230 m.p.h. Incidentally, a curious note on the new Vultees is that, although the recent Army announcement was the first the public had ever heard of Vultees being considered for Air Corps purchase, the ship already has come out with a Y preceding the A-19. The Y signifies that that airplane has undergone all experimental testing at Wright Field and that the ship now is going out for field tests. Ordinarily, a new Army airplane is first designated with an X; that is, XA-19.

In further describing the YA-19, Army officials wrote: ". . . it is a new type of three-place attack plane . . . and is designed to carry 600 lbs. of bombs either in external or internal racks; six machine guns, four fixed and two flexible. The YA-19 is supplied with electrically controlled, retractable landing gear; has a wing span of 50 feet, an overall length of 36 feet 11 inches, and a height of 10 feet. The plane's gross weight, including fuel and armament, is over 10,000 lbs." At the same time the Army bought 11 engines for the YA-19s for $114,097.50.





"Clear and Unlimited"

By SWANEE TAYLOR

Thoughts in the Hospital—

. . . *After the last visitor has left:* (Turning painfully over on one side), Gee, the Aviation Industry is one swell bunch of folks . . . never heard of such a loyal group of men and women. How they do rally 'round a pal sick or in trouble. As far as I am concerned it's worth the pain and post-operative misery. (You ought to see my incision!) . . . Strange, too, how word gets around through our private grapevine telegraph. It was an emergency operation, 11:30 at night, yet the next morning messages, visitors and flowers started streaming in to New York's very swell Post Graduate Hospital. (No freshmen or sophomores work on you here.) . . . And what a secure feeling it gives a poor—but honest—working man when the first bunch of posies comes from his own office.

. . . Wonder why people don't tell about appendicitis and take the mystery out of it? . . . It's simple enough after you stagger through the first day of reaction to shock and the second one of gas pains . . . I had my telephone removed on Wednesday night and ate steak for dinner on Saturday. The worst part of the experience is the embarrassing things they do to you. (Can't be printed, even in Snappy Stories. . . . Symptoms? Well, it is a colossal green apple ache all over the abdomen, accompanied by shooting pains in different parts of that region. (That twinge you feel in your right side is *not* appendicitis.) . . . The only relief for the "greenapple" distress is to twist your body in the general shape of a pretzel. When this feeling creeps over you get in touch with a good fast surgeon and above all, *don't take medicine!*

. . . One thing you will find, should you undergo an appendectomy, is that your thoughtful friends will do their darnest to keep you in good cheer . . . All sorts of amusing gadgets and poems will be sent and they certainly do much to take the heat out of that torrid rubber sheet beneath you. The only trouble about them is that they make you laugh, which is tough on the stitches. Your nurses, however, will save these items of mirth until the embroidery has been plucked out. (It's uncanny how these gals get to know and understand you in a few hours) . . . Here is one of the funniest which came during my own great *malade.* It was from an old War Bird and prominent New York Advertising Club-er: Shakespeare make way for Hugh Gaffney!

Swanee Taylor had a pain,
The damn thing, it came back again.
But the doctor his appendix he did take,
So, of course, he's lost his belly ache!

Another item you will enjoy hearing, I am sure, is a paragraph from a letter from one of aviation's best known writers. It certainly was a grand gesture, especially with money as tight as it is. To spare him embarrassment—he's sort of shy that way—let's just quote the paragraph and leave him nameless:

> "Out of a blue sky last week Max Karant asked me to write a 2500-word article of farewell to the old Ford tri-motor. I was all set to take the money until I read about you. Don't you need this to help pay your hospital bill?"

This, friends, together with all of your other evidences of generous spirit, did much to strengthen my faith in mankind in general and in the Aviation Industry, in particular. And I am just as certain as I am of daylight that as long as people like you are active in aviation nothing very wrong will befall our beloved Industry. Many thanks, all of you, and let me help sometime.

Kash & Karry Kiddie Kadets. . .

Of course the Junior Birdmen of America can do whatever they please, but I can't help joining the chorus of regret over this organization, to use a current phrase, "going commercial." Not that there is anything wrong with selling caps, wings, uniforms, toothbrushes, etc., etc., to the membership. Most all fraternal organizations resort to this thoroughly honest method of bolstering the treasury to pay the salaries of paid officials and boosters. These people have to eat, pay rent and buy clothes even as you and I. Yet it does give you a funny feeling in your buzzom when you recall how for years that great organization carried on so nobly without nicking the kiddies for nickels and dimes.

To be sure, in those days the Junior Birdmen had the Hearst purse to draw from and didn't have to hustle for a living. William Randolph Hearst, long an ardent supporter of youth movements, was among the first to appreciate youth's great desire to fly. With keen insight into the minds of the modern youngster he not only opened his purse but he opened the pages of his chain of newspapers to furnish the avid air-hungry moppets with an outlet. And, like all bread cast upon the waters, it didn't do his circulation a bit of harm. Nobody begrudged him a few hundred thousand extra sales daily because of his philanthropy. Besides, he spent much more on the Junior Birdmen than he could ever hope to take in.

With the passing of years the original Junior Birdmen got old enough to vote and quit tossing airplane models around. About this time Mr. Hearst, who was getting no younger, started setting his "empire" in order against the day when he will have marched down the inescapable path which emperor and slave alike must tread. Among his last acts of retrenchment was withdrawal of financial support of the Junior Birdmen of Amer-

(*Concluded on page 66*)

Frost Plane

A very useful plane that isn't a plane.

THIS airplane is worth its weight in peaches and apples. Once owned by former Assistant of the Navy David S. Ingalls, this airplane was valued at close to $50,000. Now, however, it is owned by an Ohio fruit farmer who has mounted the fuselage on a 40 ft. steel tower. The noble sky-ranger now keeps frost from destroying the fruit by revolving slowly while its propellor sends blasts of air over the orchard, preventing dew from forming on the trees and freezing.

Watch Your Heater!

PILOTS, who have been in the habit of turning off their cabin heaters for the summer, should investigate the effects of this proceeding before they have reaped the consequences of a limited air supply through the heater tubes.

In general, it is better to take the tubes off and allow the air to circulate through the heater rather than to shut off the valves because, when the heaters are blanked off by the valves, there is a pronounced tendency toward burning the heater walls or even perforating them in places where the oxidation is the greatest.

Should the heater be burned through, exhaust gases, and carbon monoxide with them, may enter the cabin with fatal consequences. Many crashes have been traced to the lethal carbon monoxide with which we cannot afford to take chances.

Designing Engine Compartments

by RAOUL J. HOFFMAN

There is much more to that section between the engine and firewall than you think. It is a vital part of the airplane and one that will make flying safer if designed correctly.

ONE section of the airplane that has been woefully neglected by designers is the portion that lies between the engine and the firewall. This apparent neglect is due to the time to be spent in making installation drawings in order to place the accessories in the most advantageous positions.

More time is spent finishing the engine compartment on an initial design having a high-powered engine than making the whole fuselage. Connections should be short and accessible not only for the sake of efficiency but for easy inspection and quick replacement.

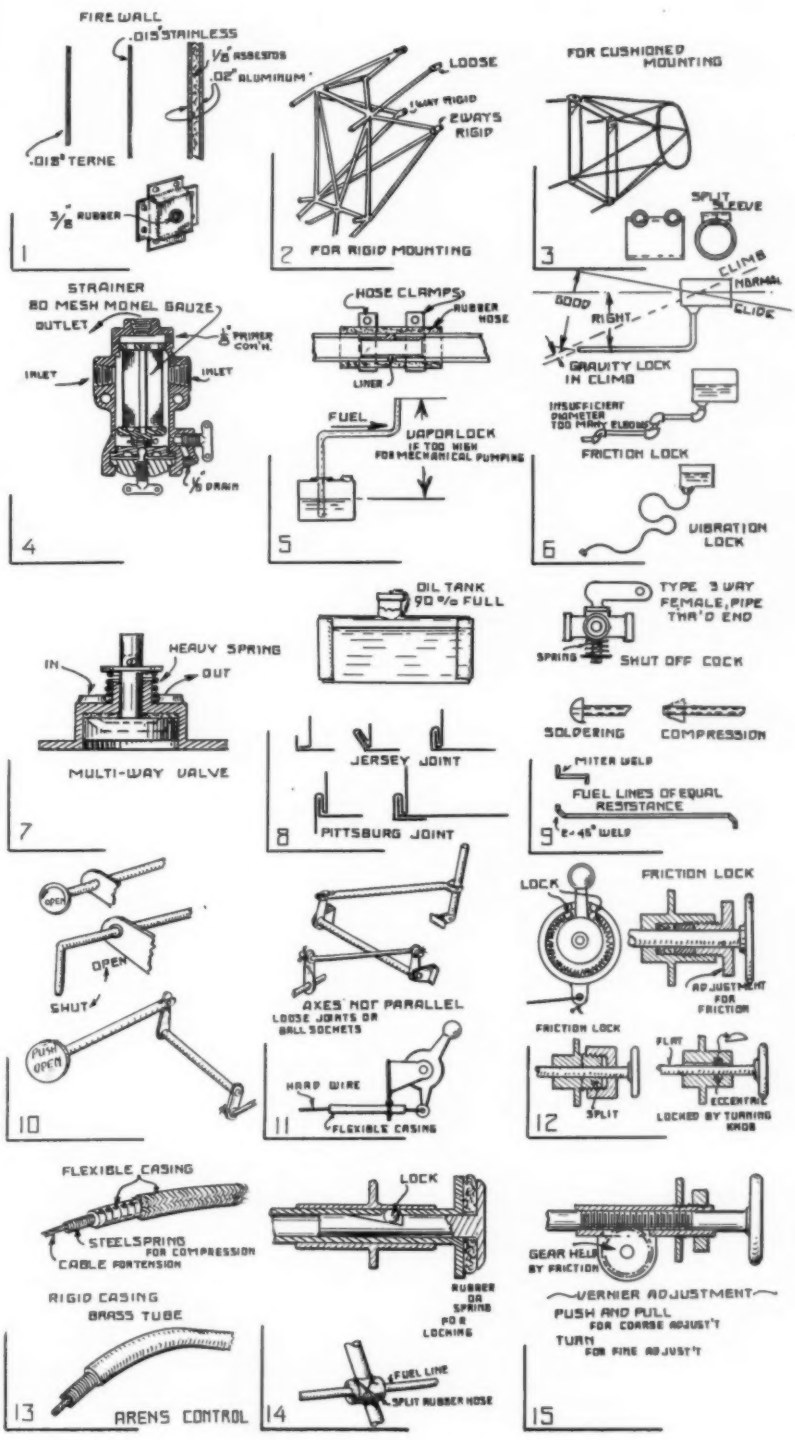
Usually the designer has less "dope" on controls than he has on wing sections or on drag coefficients. This is to be regretted, for the big problem of fire danger must be solved some day. Therefore one must always keep in mind the probability of a fire in case of a leak or break of the fuel line. This leak may occur in the air, in gliding ready to land or on the ground. For added precaution, a fire extinguisher must be carried of a capacity of one pint for lightplanes and one quart for larger ships.

In lightplanes the engine compartment has ample space for the accessories and engine controls; but on airliners the conglomeration of pipes, tubings, wires and controls requires a few redesigns before a certain simplicity and accessibility is obtained.

The engine compartment should be designed to confine an accidental fire within its enclosures. The firewall is one of the precautions. The firewall bulkhead may be a single sheet of .018-inch thick terne plate (lead-coated steel) or a .015-inch stainless steel, or a ⅛ in. thick asbestos sheet placed between two .02-inch thick aluminum sheets. (Section 1.)

All holes through the firewall should be round and closed by grommets. Standard rubber grommets, split and forced into the holes, are not very efficient. Section 1 shows a simple grommet made of ⅜-inch thick rubber block, which may be fastened to the firewall.

Most of the units in front of the firewall are supported by the engine mount. In lightplanes the mount is usually part of the fuselage but in larger planes they are detachable. In case the engine is bolted rigidly to the mount a few braces may be omitted without weakening the structure. If the engine and the mount is attached by shock-pads, then the engine mount must be designed as a rigid unit, as shown in Section 2 and Section 3. All other connections for support should be welded at the joints; otherwise clips or split sleeves ("dutchmen") should be used. (Section 3.) In production jobs



loose sleeves or clips must be eliminated.

Large strainers are usually fastened to the firewall. One efficient strainer, shown in Section 4, has pipe connections for two inlets, one outlet, one primer and one drain.

Up to 150 h.p. engine a ¼-inch fuel line is large enough; above that a ⅜-inch line should be used. The line should be capable of delivering twice the normal fuel required for full engine power.

All fuel lines should have large radius bends, which are to be annealed after bending. They should have at least one flexible joint as shown in Section 5. The line should be supported at 6- to 12-inch distances, preferably in the method shown in Section 14. Connections to fittings may be soldered or compression joints. (Section 9.)

Some of the reasons for failures of fuel deliveries are indicated in Section 5 and Section 6. Owing to heat or to altitude, mechanical pumping may create a suction that vaporizes the fuel in the line, fuel is not delivered resulting in a vapor lock.

Using gravity feed, the tanks should be so arranged that the entire fuel supply may be utilized in the steepest climb, at the best gliding angle and that no spilling is possible when side-slipping. Neglecting these details in layout we may have a gravity lock.

Too many connections and fittings, or too small a fuel line may cause a friction lock, another danger that happened in the pioneering days of aviation is the vibration lock. The vibrating fuel column creates a certain resonance that stops the flow. This is usually due to long unsupported lines, or to lines having too many bends.

Regular rubber hose should not be used for fuel lines. Nevertheless, there is a rubber hosing that may be used; it has a gasoline proof inner lining and is marked on the outside with red-white lines.

Lightplanes seldom use flexible metal hose, for joints are not easily made.

The oil tank is usually placed in the engine compartment. It should hold not less than one gallon for each 16 gallons of fuel, but not less than the amount required by the engine manufacturer. To allow for expansion and to prevent spilling, the tank should be filled to 90 per cent of its capacity. Oil tanks should be tested for an internal pressure of five pounds per square inch. Section 8 shows two sheet metal joints which are very efficient.

Oil piping shall have an inside diameter not less than the one on the engine and shall be made without splices. Some of the oil lines are made of welded tubings. Section 9 shows how a correct welding method will reduce the resistance of the flow.

One or more positive, quick-acting valves that will shut off all fuel from the engine should be within easy reach of the pilot or of the service mechanic when on the ground. Shut-off cocks or multiway valves may be employed that are leakproof and stay in the set position. Section 7 and Section 9 show a valve

(*Concluded on page 76*)

Calculators

Sirs:

. . . I have spent the last six or eight hours making up puzzling problems, and solving them, on the flight calculator and it seems to work marvelously . . .

RICHARD R. BLYTHE,
Advertising Manager.

Seversky Aircraft Corporation,
Farmingdale, Long Island,
New York.

Sirs:

. . . The design is extremely clever and will appeal to many pilots who want a graphic solution of the wind problem together with speed-time-distance and fuel consumption problem . . . the wind speed, air speed, ground speed and drift seem to be excellent . . . I think the flight log and explanation of variation and deviation on the reverse of your instrument is very clear and well done . . .

P. V. H. WEEMS.

Weems System of Navigation,
Annapolis, Maryland.

Wind Sock

Sirs:

The following two questions, which veterans of British aviation have so far failed to solve, have been put to Imperial Airways by the Technical Museum for Industry and Commerce in Vienna:

Who discovered the wind sleeve commonly used at airports?

On which airport was the wind sleeve first used, and when was this?

If any of your readers have any information on this subject . . . it would be very interesting to hear from them.

R. BRENARD.

Imperial Airways, Ltd.,
London S. W. 1, England

Wrong Bridge

Sirs:

A rebuke to your . . . editor for caption (on) page 14 of the July issue—"attacking bombers would have a fine target in San Francisco and famed Golden Gate bridge." The Golden Gate bridge is about five miles out of the picture, the bridge shown being the equally famed San Francisco-Oakland Bay bridge . . .

GORDON F. INGRAHAM.

Captain, Infantry Reserve,
Oakland, California.

• Our apologies to San Francisco for misplacing its Golden Gate bridge.—Ed.

Whew!

Sirs:

I would like to know if it would be possible for an air clipper to have eight motors . . . two wings . . . each motor has 3,000 h.p. . . . it transports 136 passengers plus a crew of five . . . top speed 310 and cruising . . . 290 . . . range 4,000 miles . . . radio controlled . . . Please notify me as soon as you can, for I am very anxious to know if it could ever come true.

FRANK KRATZER.

Wichita, Kansas.

Ships That Failed

Sirs:

My attention was called to an article in POPULAR AVIATION because the Grumman Navy fighters, Jimmy Collins and myself happened to be mentioned . . . The article is entitled "Ships That Failed" . . .

So many times it is not the airplane's fault that the Army or Navy did not buy them in quantities. The Great Lakes amphibian and the particular Loening amphibian mentioned were built to a set of Navy specifications around which it was impossible to build a desirable airplane . . . Some perfectly good designs have been passed by because the company already had plenty of business to keep them working . . . There have been times when all the personal or political influence or worse that have been used would not stand the light of day.

. . . For the most part, the Army and Navy cannot use each others' airplanes. The Army does not need an observation seaplane braced for catapult launching and with folding wings for easy storage below the decks of a cruiser or battleship. Operating off the aircraft carriers is no bargain at best and calls for arresting hooks, hoisting hooks, floatation gear, slower landing speeds and other things that the Army need not even consider . . .

To correct the record, the airplane which killed Jimmy Collins was a Grumman F3F-1 with a Pratt and Whitney *Twin Row Wasp Junior* engine. The next one which I flew was identical except for the structure being beefed up in a number of places. This one went through all its dives and all its maneuvers okay but just would not come out of a ten turn spin. After trying everything in the book for over 50 turns, I piled overboard and went home by parachute for another time. Changes about the tail surfaces . . . corrected its spinning troubles. The Navy purchased 54 of these airplanes . . .

LEE GEHLBACH.

Mineola, Long Island,
New York.

• Many thanks to Test Pilot Gehlbach for pertinent facts.—Ed.

Bouquet

Sirs:

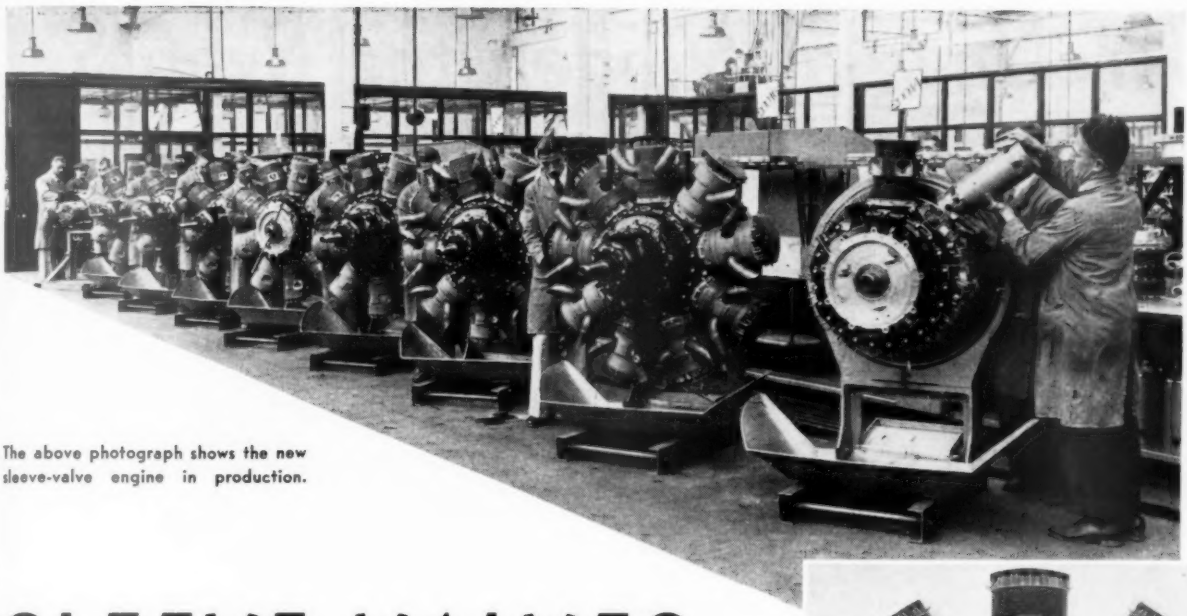
. . . Just this week I was fortunate enough to start a man flying that hadn't had hold of a stick since the war training period. He picked . . . POPULAR AVIATION up today, started reading the article entitled "How They Flew," got such a kick out of it that I realized it's the magazine I want to have here at the Port for the boys to read . . .

The man . . . is Mr. M. G. Bent (who is) in the lumber business at Morrison, Ill. Mr. Bent has purchased of us a new 50 h.p. Franklin *Cub* . . .

E. P. JACOBY,
Manager.

Sterling Airport,
Sterling, Ill.

(*Concluded on page 76*)



The above photograph shows the new sleeve-valve engine in production.

SLEEVE VALVES FOR BRITAIN

The Bristol company has set the pace with its new sleeve-valve engine, a valuable asset for aviation.

THE new Bristol engine, which has been named the Perseus XII, is a moderately supercharged nine cylinder radial unit of 52 inches diameter. It develops a maximum power of 905 B.H.P. at a height of 6,500 feet—an exceptionally good performance for an engine of this size. The power for take-off is 795/830 B.H.P., while the international rating is 715/745 B.H.P. at 6,500 feet.

In general design, the new engine corresponds with previous Perseus types, but many detail improvements have been made, especially in equipment and installation arrangements. One highly important feature which has received official approval as a result of the type test is the new "Bristol" accessory gear box by means of which the large number of engine-driven accessories now required for aircraft equipment are mounted on the bulkhead instead of on the engine itself.

This considerably simplifies installation work and also represents a valuable contribution towards the development of standardized, interchangeable power units. Several alternative arrangements of the accessories can be provided.

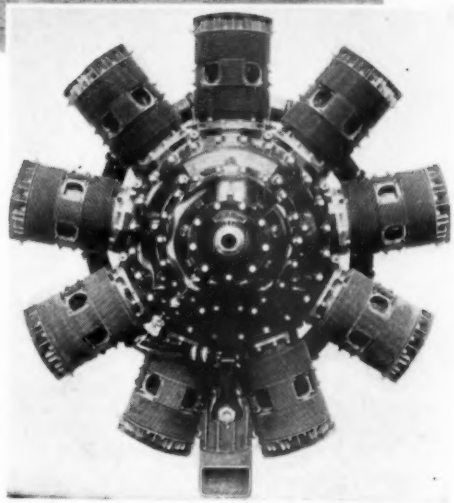
The gear box is driven from the rear of the engine by an enclosed flexibly jointed shaft, which is available in various lengths to suit different installations.

Another improvement is to be found in the magneto timing control. A variable timing device is interconnected with the throttle in such a way that the best ignition setting is obtained for every throttle position. As on all current Bristol engines, the whole ignition system is fully shielded for radio screening.

The carbureter is of the latest Claudel-Hobson fully automatic type, and is provided with a controllable hot and cold air intake of improved design. The chute for collecting cold air is integral with the main body of the intake, and projects downwards behind the rear cowl support ring. Its rear face is tapped for the attachment of a suitable streamlined fairing.

Two hot air collectors are mounted, one on either side of the intake body, and project forwards towards the two lower cylinders. Two spring loaded shutters, operated by a single control lever regulate the proportion of hot air admitted to the intake.

A standardized Bristol type low drag cowl unit is available, complete with controllable gills. An efficient aerodynamic entry is afforded by a single outlet pressed steel exhaust manifold, as used so successfully on "Bristol" poppet valve engines for many years. Inter-cylinder baffles are fitted; the shape of the sleeve valve cylinder, and the infrequency of overhauls with this type of engine, having greatly facilitated the design of baffles which are both efficient in action and simple in construction.



Here is a head-on view of the new Bristol "Perseus XII". Notice its clean design.

The Perseus XII is approved for use with a controllable pitch airscrew, a 13 ft. diameter De Havilland-Hamilton airscrew having been fitted during 40 hours of the official type test.

The engine mounting arrangements are simple and convenient, and are designed to provide interchangeability between mountings of either the rigid or flexible types, as desired.

In addition to the type test, a Perseus XII engine is undergoing extensive flight trials. Over 200 hours of hard flying have already been completed with the production type installation, including the new accessory gear box arrangement.

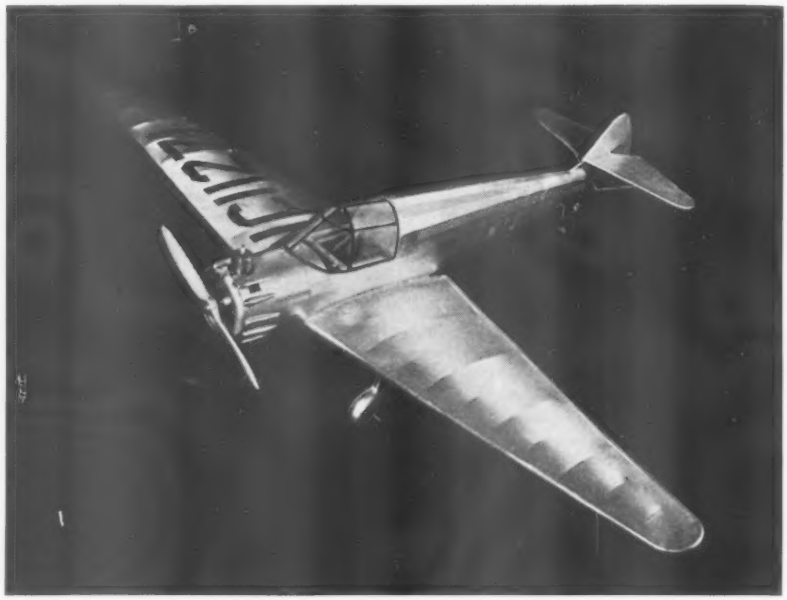
The considerable reduction in servicing requirements evinced during previous endurance trials of Bristol sleeve valve engines has again been apparent, in spite of the fact that flying has been carried out under very adverse weather conditions, and to a test schedule which subjects the engine to intentionally severe treatment. END

An Unusual Model: the Ryan S-C

by PAUL W. LINDBERG
Model Editor and Designer

AN altogether new gas model of the low wing type has been tested by our department. This beautiful model of the Ryan S-C can be flown either as a gas-powered or rubber-powered model. All low wing models are very tricky in launching and flying, so it will be necessary to take added precautions in flying your model so as not to damage it.

By enlarging the plans four times the size shown in the magazine, a true replica of the model will be had.



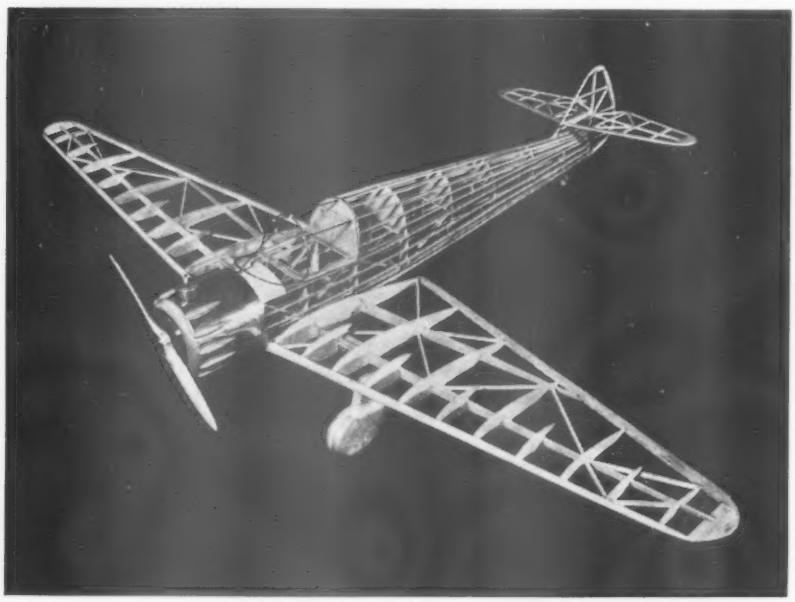
The S-C makes a beautiful model and can be flown either as a gas- or rubber-powered ship. Low wing models, however, are tricky and care should be taken in flying them.

CONSTRUCTION OF FUSELAGE

The main longerons are of 1/8-inch strong balsa. Having placed a piece of waxed paper over the full-size of the plans, these pieces are laid directly on the side view of fuselage. Construct the two sides and when they have become thoroughly dry, cement in all cross members so as to form the rectangular body.

From 1/16-inch sheet balsa, cut the formers and cement them in their proper positions. Position of all stringers is clearly shown in the plan under detail of sections of fuselage. It is a wise stunt to sight the stringers from front to rear to make sure they are in proper alignment. It is best to cement the firewall in position before attaching stringers.

The cabin hood is constructed of 1/16-inch iron rod and balsa. This is removable so that inspection of batteries and adjustment can easily be made. Hood is covered with a thin grade of celluloid of which there are full size templates on the plan. The cowl ring is built up from 1/8-inch thick sheet balsa. By simply carving off the surplus edges, the proper shape is automatically had. Cowl ring is held securely to firewall by eight pieces of 1/8-inch x 1/2-inch x 1 9/16-inch balsa supports. For position of these pieces, see the front view of the firewall. Bottom half of cowl is covered with thin cardboard from the rear of cowl ring to F-9. This thin piece of cardboard continues halfway around the fuselage and is fastened to the center stringer on either side. Cement securely in position. Upper part of cowl is made from thin aluminum, template No. 1. This is removable so that one may make repairs on motor, tank, etc.



Minus its covering, the S-C displays its rugged, well-built framework. The "pants" on the landing gear are for show purposes only and should not be used while flying.

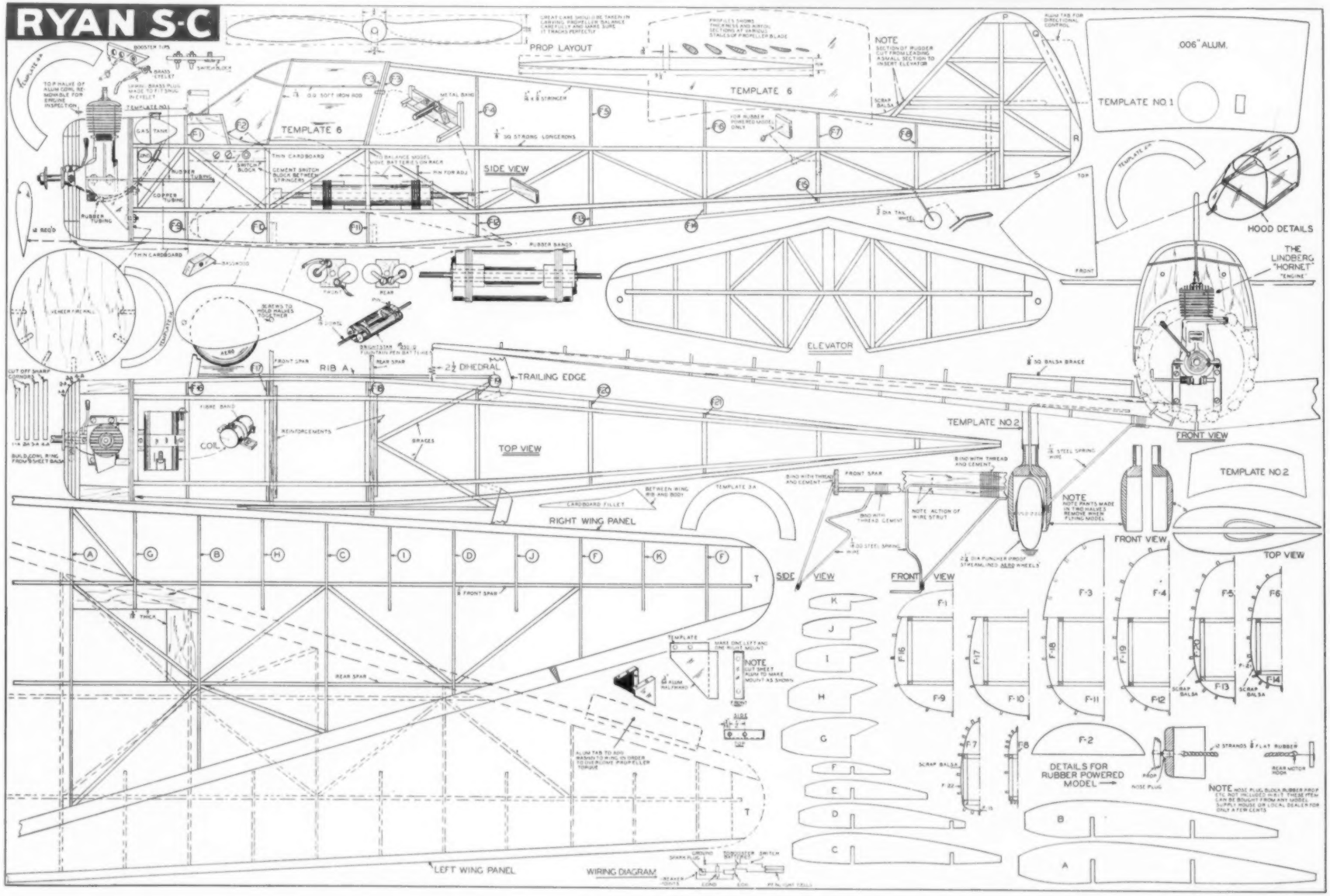
CONSTRUCTION OF ELEVATOR AND RUDDER

Construction of the elevator and rudder is so simple that very little may be said on how to build these two units. We might add that they are both of a flat section, 1/8 inch in thickness. Construct upon a flat surface so they will have no tendency to warp. Repeat this operation when covering as it is imperative that they must have no warp whatsoever. The rudder carries an aluminum tab which is inserted into it, having first cut a slot in it to receive the tab. A small amount of adjustment is needed in the rudder tab as to the directional flight of your model.

CONSTRUCTION OF THE WINGS

All ribs are cut from 1/16-inch sheet balsa. Spars are next placed in position. Cement each rib securely in its exact position as shown on plan. Leading and trailing edges are next cemented in place after they have first been carved and sanded to shape. It is very important that the 1/8-inch bracing is not omitted as this strengthens the wing to prevent same from warping out of shape when covered. The wing carries an aluminum tab so that a small amount of wash-in may be had to counteract propeller torque.

(*Continued on page* 89)


RYAN S-C
PROP LAYOUT
TEMPLATE 6
SIDE VIEW
TOP VIEW
ELEVATOR
RIB A
2½ DIHEDRAL
TRAILING EDGE
RIGHT WING PANEL
LEFT WING PANEL
WIRING DIAGRAM
TEMPLATE NO.1
TEMPLATE NO.2
.006" ALUM.
HOOD DETAILS
THE LINDBERG "HORNET" ENGINE
FRONT VIEW
SIDE VIEW
DETAILS FOR RUBBER POWERED MODEL
NOTE
F-1
F-2
F-3
F-4
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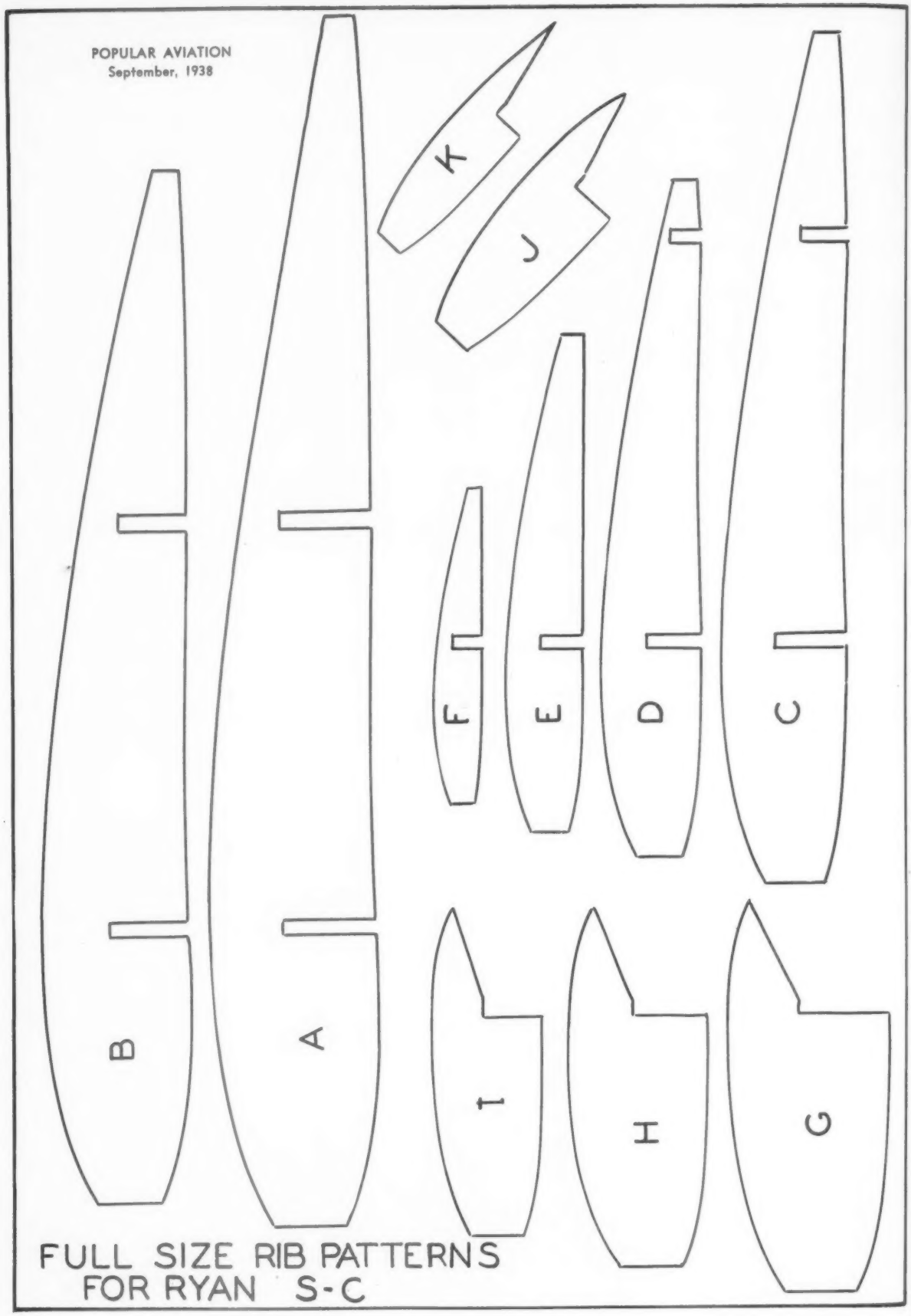

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"OK" for the new "50"

ALTHOUGH announced only a month ago the new 50 horsepower engines for Cub airplanes have received the enthusiastic "OK" of leading pilots everywhere—private fliers as well as instructors. The 50 H.P. Cubs give you quicker take-off, faster climb and more speed—higher performance than found in any other plane within hundreds of dollars of the low price of this most popular of all ships.

The Cub—seaplane or landplane—is now available with a choice of 50 horsepower engines, including Continental, Franklin, Lenape, Lycoming, and Menasco—in addition to the Continental 40 horsepower engine. If you haven't flown this ship, do so at once. You, too, will stamp it with your "OK." Your Cub dealer will be proud to give you a free flight demonstration in this world-beater.

FREE FLYING COURSE

Every purchaser of a new Cub airplane is entitled to a free flying course, including dual flight instruction by a Government licensed instructor. Get a new Cub for only $425 down . . . and learn to fly your own plane without paying a cent for dual instruction. See your dealer for a free flight demonstration.

Prices Below Are for Planes with the Continental "40"

CUB TRAINER $1270 F. A. F. Factory **$425** DOWN

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CUB SEAPLANE $1965 F. A. F. Factory . . **$655** DOWN

FREE!

Send today for full details on the free flying course, free Cub folder and name of your Cub dealer. Paste coupon—or write your request—on penny post card, if you wish. Piper Aircraft Corporation, 98 Aviation Street, Lock Haven, Pa., U.S.A.

PIPER AIRCRAFT CORPORATION
98 Aviation St, Lock Haven, Pa., U. S. A.

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COUNT THE CUBS

THE WORLD'S FASTEST SELLING AIRPLANE

The First Gas Model

(*Continued from page* 52)

The engine was now rebuilt to make it suitable for longer flights. The new cylinders were made from steel tubing, ½ inch thick, which was machined to form cooling fins one-quarter inch apart. The old cylinder heads were used in order to save time and money, otherwise a better engine could have been produced. Still, with a weight of only 10 pounds it delivered 3.2 h.p. at 1,800 r.p.m. and could even maintain 5.1 h.p. for a few seconds when running at 3,000 r.p.m.

Finally in October, 1901, the engine was finished and installed in the model; everything was ready for test. But now the work on the large aerodrome had reached a stage where it demanded the full attention of Manly and his assistants, the quarter-size model was put aside and nothing was done with it until April, 1903.

In many respects, this was unfortunate, for many believe today that, had experiments with the model continued unhampered, even greater results would have been obtained. As it was, though, the model was forgotten in favor of the large ship.

Like all Langley's aerodromes, the gas-powered model was a tandem monoplane; it was an exact quarter-size replica of the full-size aerodrome, with the exception that relatively larger propellers were used. The engine was also larger than one-fourth of the full size engine, and the frame had to be modified slightly for this reason. The engine power was, however, much less than ¼ the power of the large engine which could deliver 52 h.p. The total weight of the quarter-size model was 58 lb., and the wing surface 663 square feet.

The advantages of biplane wings had been considered and the steam models had been flown as biplanes, but the monoplane had been found most efficient, and it was decided to use this type for the initial flight. The plan was, however, later to build biplane wings for the large aerodrome, and another set of wings was built for the quarter-size model, for use in later tests. Because Langley did not want to change the method that had worked so well for the steam models, he retained the catapult launching, planning to try flight directly from the water afterwards. For his purpose floats were built for the quarter-size model, but they were not used in the tests.

Finally in July, 1903, the large aerodrome was ready for test, and both that and the quarter-size model were taken down the river to Widewater. Trial of the quarter-size model was delayed first by engine trouble, due to a short circuit in the ignition system, then by inclement weather. At last, on Saturday, August 8, the weather was right and the gas model was ready for flight. About 9:30 in the morning it was catapulted into a 12-mile wind. The aerodrome started off on a perfectly even keel, flew straight ahead for 350 feet, then began to circle to the right, descending slightly as it circled. Upon completing a quarter circle it again began to rise, flying straight ahead until it had gone a similar distance, when it again lost its headway, but before it reached the water the engine regained its normal speed. The aerodrome touched the water with its propellers still revolving, but very slowly.

The flight must have been very beautiful as even the newspaper reporters, who were unfavorable to Langley for his secretiveness, commented upon that. But they called the test only partially successful because of the shortness of the flight. The aerodrome was in the air 27 seconds and the total distance was about 1,000 feet. Langley and his assistants had hoped for a much longer flight and were somewhat disappointed, yet the flight was only surpassed by those of Langley's own steam-driven models.

At first it was impossible to account for the engine running so irregularly and slowing down so soon. After a while one of the workmen explained that in filling the gasoline tank he had been overanxious to get it completely full to insure a long flight, had filled it to overflowing and had spilled some gasoline into the intake pipe. This excess gasoline interfered with the control of the fuel mixture and caused the engine to slow down.

An eyewitness, Professor John M. Manly, brother of Langley's chief assistant, who saw the flight from the attending tugboat, wrote the following description immediately after the trial:

"The rocket gave the starting signal and instantly there rushed toward us, moving smoothly without a quiver of its wings, with no visible means of motion and no apparent effort, but with tremendous speed, the strange new inhabitant of the air. Onward it moved, looking like a huge white moth, but seeming no creature of this world, not only on account of its size, its ease of movement and its wonderful speed, but also because of its strange, uncanny beauty. It seemed visibly and gloriously alive as it advanced, growing rapidly larger and more impressive. Straight at us it came, and for a moment there was a wild fear htat it would come right on and crush itself against the ponderous tugboat. There was a half impulse to move the tugboat out of its way, but the aerodrome seemed to realize its danger and rapidly, though not abruptly or violently, as if it had intelligence and power of self-direction, it checked its speed and circled to the right, descending slightly. Soon it quickened its speed again and went straight ahead for about ten seconds, when it again checked its flight and descended, circling once more. Once again it attempted to increase its speed and rise, but it was too near the water, and in a few moments the waves had wet its propellers and wings, and it sank, a poor bedraggled creature. But the vision of its beauty and power and seeming intelligence and life will long remain with those who saw the flight."

The style does not belie the fact that the author was a professor of English literature.

The model may have looked "bedraggled" when it was fished out of the river, but it had not suffered the slightest injury. As soon as the wings were dry and the water had been removed from the cylinders, it could have been tested again and a longer flight obtained. By the time the model was in flying condition again, a strong wind had sprung up, and further tests were postponed. As it turned out, the model was never to fly again.

The large aerodrome was ready for trial, and this was more important than a possible record flight with the gasoline model. Nothing was to be gained by such a flight, as it would have given no more data than the short one did. It had demonstrated that the balancing was right, and by inference that the balancing of the large aerodrome was right. The next step was to put all energy into getting the large aerodrome ready for trial.

The world's first gasoline-powered model now hangs in the National Museum, an exhibit as interesting as its larger counterpart, but with the advantage that it is not an object of controversy.

END

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NAVY DUTY *for the* S-43's

OFFICIAL U. S. NAVY PHOTOGRAPH

Off for duty go three of the Navy's Sikorskys, powerful members of America's flying fleet. In serving the United States Navy on convoy, patrol, and general utility missions, the Hornet-powered S-43 is adding new evidence to its already impressive record as one of the world's most versatile airplanes.

SIKORSKY AIRCRAFT

BRIDGEPORT, CONNECTICUT

One of the four divisions of

UNITED AIRCRAFT CORPORATION

Flying for Nothing

(*Continued from page 48*)

flying. And if the present popularity of his program holds, he will have little difficulty in doing it.

Meanwhile, the private flying school operators are lending a shoulder to promote the plan and are looking expectantly to the results.

"I believe it will create a great deal of interest in aviation in eastern Tennessee . . . it will be an advantage to the operators, especially the flying school", writes Elmer Wood, head of the Wood Flyers of Knoxville.

Freddie Lanier of the Southern Air School, Memphis, thinks it will do more to "boom private flying and flying schools than anything that has ever come to Tennessee."

Harry Porter, Porter Flying School head at Chattanooga, sees it as "the biggest boon to the private flying school yet developed."

The Gassers of the Nashville Flying Service are enthusiastic. Cecil Newcorn of the Dallas Aviation School and Air College, Dallas, Texas, gives it a big hand. Indeed, virtually every private operator in the state has registered his approval and recognizes, both in the 75 to get their wings and the 2,700 to get only the penguin's prophasis, a potential demand beyond their wildest dreams.

END

GYROPILOT
on the DC-4

With the successful completion of initial flight tests of the DC-4, aviation hails Douglas' great engineering achievement.

Up in the pilots' compartment of this great airplane are assembled the finest instruments obtainable. Prominent among them are the Sperry Gyropilot, recognized the world over as one of science's greatest contributions to air navigation, and duplicate installations of the Gyro-Horizon and the Directional Gyro. These vital instruments are manufactured by the Sperry Gyroscope Company, Inc., Brooklyn, N. Y.

SPERRY

SPERRY
GYROSCOPE CO · INC
BROOKLYN, NEW YORK

Second-Hand Wings

(*Continued from page 20*)

good service which State Department employees give, is not such a nuisance as many people have supposed, though it gives no protection to the seller. In order to sell an airplane or a component part, it is necessary for Babb to make up a report of the item's destination, forward this to Washington and wait for a reply. Four days are required, air mail.

To take care of this rigamarole, Babb has about 30 persons in his employ stationed at the Glendale office or at Floyd Bennett Field, where Ed Lund, former Howard Hughes right hand man, is branch manager. The Glendale establishment consists of a hangar, a shop, the general offices and a motor and parts stock room. The combined inventory of the two branches shows 32 airplanes actually carried in stock, and the firm has over 200 more listed for sale.

R. M. (Duke) Ressler, formerly manager of Nicholas-Beazley Airplane Co.'s western branch, covers Central America for Babb, selling new Ryan airplanes, for which the company has distributorship in that territory. Al Phelan, besides looking up all manner of airplanes, is the Western branch's manager when Babb is away. At other times, as he puts it, "I'm just one of the boys who work around here." Domestic airplane sales—and there are plenty of them—are carried on by Major Bill Frye, George Armistead and Jerome Eddy. The shop at Glendale is in charge of Jack Waterhouse, formerly chief mechanic for Gilpin Airlines, under whom work such well-known aviation characters as Walt Ferguson, for years in charge of the Bredouw-Hillard shop at Kansas City.

In the course of the years, the Babb inventory has included many famous airplanes. He sold the only single-motored Ford ever built, and now has the last of the Gee Bee racers, along with Amelia Earhart's famed red Lockheed *Vega*, in his hangar.

There are lots of stories floating around about Babb and his airplanes. A figure who has become almost legendary in such a short time naturally draws tall stories around him like flies around a custard pie. Most of these are not true, just as most of the stories about Henry Ford and the Model T were not true. People just like to talk about Henry Ford and have to make up some of the stories in order to do it. The same applies to Babb. But they serve Babb's purpose.

As he sees it, there is only one story. He has established a business in aviation, and his thesis is that any sound aeronautical enterprise, run on a business basis, will succeed. He allows other operators the pleasure of making Rube Goldberg airplane deals. Babb says that this is not business. Instead, he tries to buy airplanes intelligently and, after rebuilding them, sells them at a decent margin. By doing this, he knows he will make money.

Not as exciting as the old, hook and skin aviation. But it's more profitable. Ask Charley Babb.

END

. . . Clear and Unlimited

(*Continued from page 56*)

ica. It is easy to imagine the old gentleman's reluctance at having to send one of his "children" out into the cold world. And it is just as easy to visualize his hope that some far-sighted younger man would take the abandoned child under wing.

Alas, however, the hitherto sheltered youngster decided to jump into the swim of trade and mart—selling all manner of gimcracks to kids who quite likely will develop a marked propensity against buying such. . . . I'd like to say junk! For one thing, kids today know that they can get anything they want free, from a gilt fried egg to a Baldwin locomotive, by the simple device of eating a few boxes of certain brands of breakfast mush and sending in the box tops. Jimmie doesn't have to spend his nickels to join a model airplane club; there are too many of them free. Which may, or may not mean that the Junior Birdmen, like many another stripling fresh from under the paternal wing, will have to go on relief. It really doesn't matter much one way or another.

To repeat, the Juniors can do anything they like. They are duly incorporated, legal in every way, and I'm sure that there is nothing shady whatsoever in their set-up, procedure or aims. Also, this is a relatively free country where individual pursuit of health, wealth and happiness is a cherished heritage. So more power to them, may all of them grow up in due course to be bold, brave Senior Birdmen—to the glory of God and Flag.

Boosters . . .

Apropos nothing at all—certainly not the Junior Birdmen—isn't it about time to turn the damper down on the sundry "boosters" who, uninvited, insist on boosting aviation? Flying long since has climbed above the reach of willing hands on the ground. The original definition of the word was, to push or lift from beneath. And back in the days when there was need of a helpful push up off the ground there were few "boosters" to be found. This is one industry which has had to fly itself to economic security. Not until the business was off the ground, headed for bigger things, did the helpful siss-boom-bah-er's come galloping along to help. I use the word "help" advisedly. What little good a few earnest souls did was greatly overtopped by the damage done by the foolishness and mistakes of the self-seeking majority.

Yes, the Industry is off the ground and climbing nicely. There is no need of help from below. What we still must do is keep a sharp eye on our instruments and continue to sell our vehicle to a buying public by performance and demonstration. But we all know this—have known it for a long, long time. I think I'll shut up.

END

INDIANA STATE TEACHERS COLLEGE LIBRARY

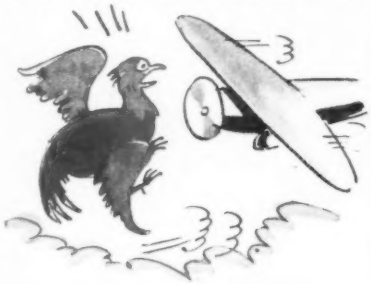
The Birdmen's Perch

Beats all how the Perch gets around. This month we even had a couple of foreign correspondents—Cyril Mann, of London, England, and Gordon P. Smith, of New Plymouth, New Zealand. To these and all other contributors . . . *thanks!* And let's have a Whopper, a Puzzle Solution, or a nice social letter from the rest of our readers.

MAJOR AL WILLIAMS, alias "Tattered Wing-Tips," Mgr.; Gulf Aviation Products, Gulf Bldg., Pittsburgh, Pa.

WHAT-HAPPENS-WHEN-A-BIRD ETC. DEPT.

Incomplete returns prevent our publishing the final vote on this much debated subject. But we thought you might like to know the score is awful close . . . the bird is awful dead . . . and we, too, can hardly wait till next month for the results.



THE PUZZLERS' CORNER

This month's problem is a cinch. But we warn you . . . take two looks at your answer before you mail it in to be checked. Credit for the sticker goes to Ainsley Carson of Spofford, N. H.

A clock in the offices of an oil company whose name we won't mention looks something like this:

If it takes the clock 30 seconds to strike six o'clock, how long will it take to strike twelve?

(What did we tell you? . . . it *is* easy. Send your answer to T. W. T. to be checked.)

HONOR ROLL

While we're on the subject of puzzlers, we'd like to doff our hats to the following who submitted solutions to our head-scratchers recently: W. Blake Henderson—Alfred M. Neff—Eugene Clark—Ralph J. Williams—Bob "prop wash" Dansfield—W. M. Sheffield—Amos Till—George M. Crawford—Warren C. Prosser—Henry Meredith—John R. Bell—Jack Turnquist—Bob Gleue—George B. Burger—Frank Cibino—John F. Bartel—Clarence Meshberger—Ward Gaffin—Kenneth Pitts—John Beland—John R. Krhen, and several squadrons of others who failed to give us permission to publish their names.

. . . gentlemen and scholars all!

And as they hurtled through the air
The darn thing kept on sewing—

FLASH! SCOOP! EXCLUSIVE!

Gulf scores a beat on all other oils with its unique Alchlor process used in refining Gulfpride—the world's finest oil for planes!

This remarkable, Gulf-owned process—*employed in addition to conventional* methods—digs down *extra* deep into the 100% Pure Pennsylvania . . . removes as much as 20% *more* motor-gumming sludge and waste!

THIS MONTH'S WHOPPER

Come, gather 'round, my hearties,
For now at last you'll see
How Mrs. Baker come to win
The yearly quilting bee.

For weeks and weeks the Gulchville calm
Was broken by the scream
Of frantic women, frantically,
'A stitchin' on the beam.

Now Mrs. Bake— 10 minutes left—
Was leading by a bit
When suddenly her darn machine
Broke down . . . it went and quit!

But Husband Jim, renowned in town
For bein' bright as brass,
Rushed out and grabbed a gallon of
Gulf Aviation Gas.

He poured some on the working parts
Then Sputter! Crackle! Boom!
And Mrs. B., machine, and quilts
Went flying from the room!

And as they hurtled through the air
The darn thing kept on sewing—
It like to made a million quilts
The way that it was going!

Yes . . . Mrs. B., she copped first prize.
The judges said: "How clever!"
But on *that* gas the old machine
Will turn out quilts forever! **Bob Ferry**

Gulf Oil Corporation and Gulf Refining Company . . . makers of

GULF **GULF AVIATION PRODUCTS**

Annie Oakley, Inc.

(*Continued from page* 40)

Unfortunately, airline wage scales are so low that few employees can afford to pay for even half-fare transportation. At one time, Eastern Air Lines had a number of young men in their New York ticket office who had been no further over the system than Washington—and only a couple had been that far. These were men who were serving the public, selling transportation to cities they had never seen over an airline they had little opportunity to become acquainted with.

Insofar as government employees are concerned Post Office Department and Bureau of Air Commerce inspectors are required to travel the lines constantly. The airlines are required to grant them transportation which may be *subject to space* or *positive* at the discretion of the passenger. At the same time 881 passes were issued in 1937 to Federal employees who were traveling on *unofficial* business. Included in this group were 62 members of Congress and 527 from miscellaneous governmental departments other than the Department of Commerce and the Post Office Department.

The problem of passes to agents selling air transportation (hotel porters, telegraph offices and travel bureaus) is a difficult one. It is desirable for these people to travel by air if they are to be of assistance in selling air transportation. But where the condition exists that permits the agents to prey upon the airlines—through the airlines own distrust of each other and unethical practices—it is a sorry plight indeed. Unjustified passes are rife among this group.

Passes issued for publicity, sales promotion and advertising purposes, if used with discretion are a valuable asset to the growth of air transportation. But again abuse of the pass privilege is prevalent in this group—because the airlines will not cooperate in the matter.

If it were possible to tabulate the unjustified passes which have been issued by airlines, the amount would be amazing. This statement is not made with knowledge of actual figures, but does spring from an intimate knowledge of airlines and long association with them.

AUGUST 23, 1938

In the recent legislation passed by Congress creating a Civil Aeronautics Authority comes the first gleam of light in many years which promises relief from a situation which, in many aspects, has been growing rapidly intolerable. The provisions of this Act go into effect August 15.

According to this Act only "directors, officers and employees and their immediate families; witnesses and attorneys attending any legal investigation in which any such air carrier is interested, . ." may be issued free or reduced rate transportation. In addition certain other people may be carried in case of emergency.

Specifically the section of the Civil Aeronautics Act of 1938 referring to free transportation is as follows:

"No air carrier or foreign air carrier shall charge or demand or collect or receive a greater or less or different compensation for air transportation, or for any service in connection therewith, than the rates, fares, and charges specified in its currently effective tariffs; and no air carrier or foreign air carrier shall, in any manner or by any device, directly or indirectly, or through any agent or broker, or otherwise, refund or remit any portion of the rates, fares, or charges so specified, or extend to any person any privileges or facilities, with respect to matters required by the Authority to be specified in such tariffs, except those specified therein. Nothing in this Act shall prohibit such air carriers or foreign air carriers, under such terms and conditions as the Authority may prescribe, from issuing or interchanging tickets or passes free or reduced-rate transportation to their directors, officers, and employees and their immediate families; witnesses and attorneys attending any legal investigation in which any such air carrier is interested; persons injured in aircraft accidents and physicians and nurses attending such persons; and any person or property with the object of providing relief in cases of general epidemic pestilence, or other calamitous visitation; and, in the case of overseas or foreign air transportation, to such other persons and under such other circumstances as the Authority may by regulations prescribe."

On the face of it, this Act of Congress should eliminate the pass chiselers along with everyone else not employed by the airlines.

It remains to be seen whether such will be the case. The railroads have a similar ruling, with heavy penalties invoked by the Interstate Commerce Commission for violation. But passes seem to be issued on railroads almost at will.

I have it on good authority that employees of steamship companies and travel bureaus have no difficulty getting rail passes whenever they wish. Many times these people are traveling for business purposes for their companies, not for personal pleasure.

The loss of the pass-granting privilege at will is a hard blow to the publicity departments and sales departments of the airlines even though it also eases many of their worries at the same time.

Air transportation, as such, is only 12 years old. When the railroads were at that age it was not unusual for them to *pay* passengers to ride on their trains just so others might see them and gain enough confidence to follow in their footsteps.

While slightly more than 1,000,000 passengers were carried by air in the United States in 1937, the actual number of air travelers is considerably less. It has been estimated that the number of people—not passengers (one man traveling over three airlines is three passengers)—carried may lie anywhere between 250,000 and 400,000. The lines have a long way to go before air transportation is accepted on a scale of enough magnitude to provide them with a constant and profitable flow of passenger traffic. Judiciously used, free transportation could do much toward educating the proper parties who could and would pass their lessons on to the public at large, either through the press or by direct contact. Similarly, transportation exchanged for advertising could do much to ease the burden from the financially badgered airlines and allow them to take advantage of such opportunities.

It may be a hasty conjecture, but it seems almost certain that the airlines will find many and devious methods of issuing free transportation to whom they wish—despite the Civil Aeronautics Authority ban—particularly if the airlines gain thereby.

With years of sly dealings between themselves to guide them, and the reported example set by the railroads, it would seem silly to think that they will hew closely to the line except when it may be advantageous.

END

IF IT'S MORE THAN 100 MILES FLY!

Air-conditioned at Airports — Air-cooled in Flight

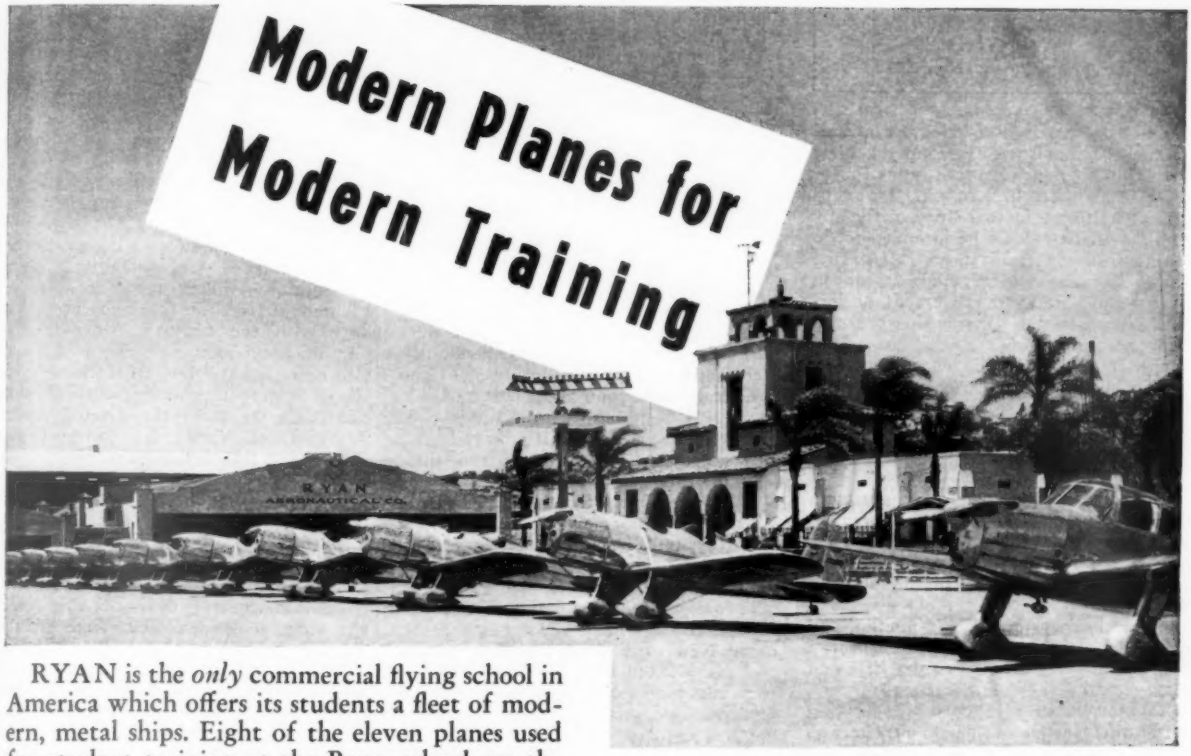
Travel experience says go on Flagships. Convenient schedules to 57 major cities. It's only an overnight's sleep from coast to coast by Skysleeper. No change of planes. The Southern All-Year Route. Delicious meals without charge. 10% saving on round-trip flights . . .

Ask Your Travel Agent or Call

AMERICAN AIRLINES Inc.

The American Standard of Service

Modern Planes for Modern Training



RYAN is the *only* commercial flying school in America which offers its students a fleet of modern, metal ships. Eight of the eleven planes used for student training at the Ryan school are the latest Ryan S-Ts and Ryan S-Cs, none of which is more than two years old.

Ryan S-Ts with 125 h.p. engines are the same as the ship in which Tex Rankin won the International Aerobatic Contest in 1937. The Ryan S-C is the new 3-place cabin plane first displayed at the Chicago Aircraft Show and accepted as the industry's most modern medium sized cabin ship.

Ryan S-Ts and Ryan S-Cs include these modern features:

Metal construction similar to modern transports.

Low wing design similar to modern transports.

Flaps and tabs similar to modern transports.

Tandem seating (Ryan S-Ts) similar to military trainers.

Unsurpassed vision. Cruising speeds 127 to 135 m.p.h. Top speeds up to 150 m.p.h.

Consider carefully the type of equipment in which you will learn to fly. No flying school can be called modern that is not using late type modern equipment. Compare the equipment at Ryan with that offered at other schools and learn why students prefer Ryan School of Aeronautics with its modern facilities, friendly, capable instruction, direct affiliation with extensive aircraft manufacture and ideal location in San Diego with the greatest annual flying of any city in the United States.

RYAN FLYING MECHANICS ENGINEERING

SCHOOL OF AERONAUTICS

LINDBERGH FIELD, SAN DIEGO, CALIF.

Please send information on courses checked with revisions in conformity with new Civil Air Regulations:

FLYING COURSES
- ☐ Master Pilot
- ☐ Commercial (formerly transport)
- ☐ Limited Commercial
- ☐ Private
- ☐ Solo (formerly Amateur)
- ☐ Deluxe Combination—includes a new Ryan S-T-A plane with complete commercial course.

GROUND COURSES
- ☐ Aeronautical Engineering
- ☐ Airplane Drafting and Design
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- ☐ Master Mechanic and Flying
- ☐ Aircraft Welding
- ☐ Advanced Navigation
- ☐ Master Radio

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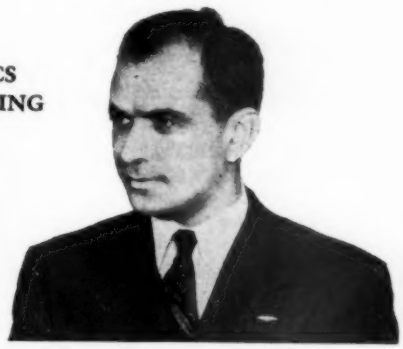

T. CLAUDE RYAN—manufacturer, pilot, educator with 21 years of aviation experience. Founder of aircraft companies bearing his name, the products of which include Lindbergh's "Spirit of St. Louis," and today's most modern, metal, sport training and cabin planes. President, Ryan Aeronautical Company, and Ryan School of Aeronautics.

Spy!

(*Continued from page 22*)

the FBI's ace anti-espionage investigators, credited with dragging the New York spy ring into court, resigned after the case had been broken with the intention of writing a factual story of the spy ring's activities. This he intended to do for two reasons: First, to inform the American people of methods employed by foreign spies and the extent of foreign espionage activities in this country, and, second, to warn the American people against the inadequacy of the existing intelligence services to meet the menace of foreign spy rings, in the hope that public demand might be aroused to strengthen the arm of the Federal government.

But the FBI, instantly alarmed, moved promptly and, though warned only a day in advance of scheduled newspaper publication of Turrou's initial article, succeeded in blocking publication, pending court decision in the case, raising the twin barriers of court injunction and Presidential ukase. Even a censored account of the workings of the FBI and Army and Navy intelligence officers, who are working in close cooperation with the Justice Department, it was feared, would weaken the powers of the Federal government to cope with the foreign spy invasion by disclosing to foreign agents something of the counter-espionage plan which might prove of value to the spy ring in shielding its activities.

Army G-2 and the Office of Naval Intelligence in themselves can do little against the spy rings for lack of personnel and funds. Officers assigned to these services are doing all they can, of course, to disclose and counteract foreign spy activities but can do nothing more than turn their findings over to the FBI when the time for action arrives.

Despite the precautions taken against leakage of any official information, however, some of the major aims of the foreign agents, especially with regard to American aviation, are known even to unofficial observers in Washington.

It is known, for example, that foreign spies are seeking every scrap of information on American plans for catapulting of heavy, long-range bombardment and reconnaissance airplanes. They are especially avid for details of our new aircraft bomb sights. Greatly improved sights, employing gyroscopic stabilization, during recent months have tremendously increased the bombing accuracy of the American squadrons and made possible successful bombing from altitudes beyond effective anti-aircraft gunfire range. Foreign agents are willing to risk their lives for the secrets of the new sights.

All of the United States aircraft plants which have service orders for new types of Army and Navy airplanes and especially those at work on experimental types are the object of foreign espionage. The foreign activities against the Seversky plant are widely known as a result of the New York spy indictments. Army and Navy intelligence and the FBI are working hard to protect other plants engaged in production of airplanes, engines and equipment for the services—Douglas, Consolidated, Boeing and all along the line to Brewster Aeronautical Corporation on Long Island which has just gotten initial orders from the Navy Department for production of its new experimental fighter, latest of the service contract awards.

It is known also that the agents of a number of foreign governments are seeking information of ammunition racks, electrically operated bomb releases, power-operated machine gun turrets and other installations on the new military airplanes. They are especially eager for details of experimental designs of high-powered aircraft engines.

The New York grand jury returned indictments against 18 persons, charging 24 overt acts intended to rob the United States of details of its finest defensive developments. There were, in addition, two substantive indictments, one concerned with the theft of plans for the new Army pursuit airplane under construction by the Seversky Airplane Corp.

Among those indicted who were especially concerned with obtaining aviation information in this country were Captain-Lieutenant Udo von Bonin, on espionage duty with the German Air Ministry; Captain-Lieutenant Hermann Menzel, also on espionage duty with the German Air Ministry; Guenther Gustave Rumrich, deserter from the United States Army; Erich Glaser, German-born private in the 18th Reconnaissance Squadron, stationed at Mitchel Field, N. Y.; Werner G. Gudenberg, former Curtiss-Wright employe; Otto Hermann Voss, mechanic in the Seversky experimental section, and Dr. Ignatz Griebl, employed at Buffalo with Gudenberg.

Thus the representatives of this single spy ring, it is disclosed, were in the regular Army Air Corps, the Reserve, and in factories that manufacture and experiment with the latest Army and Navy aircraft developments, with the backing of experienced military directors in Berlin.

Gudenberg was employed on the Curtiss SBC-3 scout-bomber when it was in its experimental stages in 1935 and it is charged that he removed a blueprint for the bomber from the factory one night long enough for a fellow operative to reproduce the whole design photographically, whereupon the purloined blueprint was restored to its file. Although the photographs eventually fell into the hands of the Office of Naval Intelligence, Gudenberg for the time being escaped suspicion.

Gudenberg then filed an application for a position in the Naval Aircraft Factory at Philadelphia, the heart of a vital aircraft and engine research and construction program. In the meantime, however, Gudenberg went to work in the Hall Aluminum Company plant in Bristol, Pa., which has been manufacturing torpedo-bombers for the Navy. He was still employed there when he became a suspect. After appearing twice before a grand jury as a witness, he fled the country, apparently under orders from an agent or agents of the Gestapo, German secret police.

Rumrich, the deserted Army sergeant, is credited with the fantastic, abortive plot to kidnap Col. Henry W. T. Eglin, commander of Fort Totten, with a view to robbing him of the mobilization plan of his regiment, the 62nd Coast Artillery anti-aircraft. It was through this plot, however, that the activities of the ring became fully uncovered. After preliminary work by Maj. J. N. Dalton, Second Corps Area G-2 officer, had disclosed the seriousness of the situation, the Federal Bureau of Investigation was called in and Turrou was assigned as the head of a special squad to "break" the case.

(*Concluded on page 72*)

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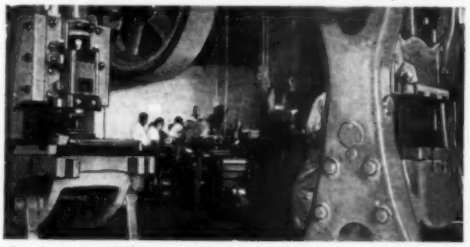

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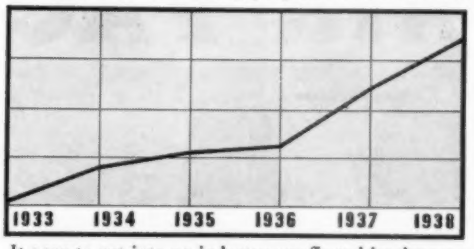

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Spy!

(*Continued from page 70*)

Rumrich confessed that his employers were especially interested in Naval aircraft and aircraft carriers and he selected the names of young officers from Naval orders with the idea of attempting to corrupt them. It is the belief of the investigators that heads of this particular spy ring were most keenly interested in details of the arresting gear used on United States carriers. Although somewhat similar gear is used by other navies, none approaches in technical perfection that developed by our Navy, the secret part of the gear being the below-decks equipment used to impart tension to the arresting cables and bring the landing airplanes to a rest without harmful stresses. Rumrich is alleged to have attempted to obtain information concerning this secret portion of the arresting gear from an ensign who was being transferred from the aircraft carrier *Ranger* to the new carrier *Yorktown*. The young officer immediately reported the affair to his commanding officer.

The newest of the carriers, the *U. S. S. Enterprise*, which began its trials in May, was another espionage target. United States authorities have seized a letter intended for Rumrich offering $1,000 for information about this vessel and carrying instructions for the offering of "increases in pay" to junior officers.

Of the 18 persons indicted, only four were arrested, the others being in Germany, safe from extradition proceedings. One of those arrested, Voss, was taken into custody at his bench in the Seversky factory. He was indicted on charges of having made sketches showing secret details of the construction of wings and fuel compartments, bomb racks and armament of the Seversky Army pursuit airplane.

END

Fleet Problem 19

(*Continued from page 18*)

command, which remained indoors while their subordinates perished in a black maelstrom.

The first long-range fatal patrol bomber crash occurred August 24, 1937. In the uncertain light of twilight, the pilot of a flying boat was coming in for a practice landing in San Diego harbor. He had difficulty distinguishing the water, which at that hour appeared slate-gray. There were still several feet to go, he must have felt, when the bow of the flying boat struck the water with a mighty jolt, trapping five of the seven occupants in the hull, a wrecked maze of metal. The only ones saved were two enlisted men.

This accident might have been avoided, it has been pointed out since.

"Float lights in the bay, similar to that used by Pan American Airways could have outlined the landing runway in the harbor, showing the pilot exactly where to come down," it was explained by one of the naval pilots shocked by the disaster.

It was a comparativevly simple matter, but the men who don't have to make night practice landings did not believe that necessary—not even for the youthful aviation cadets and junior grade lieutenants who are inexperienced in the handling of the giant bombers and might require certain safety aids until they have become thoroughly accustomed to the controls of the Navy's expensive new war planes.

Only by the sheerest good fortune were the lives of 15 persons attending a night beach party on the Coronado Silver Strand last June saved when the pilot of another airboat mistook the sandy ribbon on the edge of the Strand for water.

The 13-ton plane made a belly landing on the beach, plowed through the sand, its engines roaring, and heading straight for the picnickers, who flung themselves in all directions to escape being crushed by the bomber.

Had any fatalities occurred here, an open scandal might have resulted. As it was, the official hush-hush was applied, and the only details of the incident, which might have been averted through the simple expedient of float lights, could be obtained by the press from the members of the beach party.

Unexplained and still a mystery even to Aircraft Scouting Force officials is the cause for the disappearance last January 5 of a patrol plane with seven aboard, off the Southern California coast. Sent out as part of an emergency security patrol drill and to run down rumors of strange craft in the vicinity of the mainland, the bomber dropped from sight without a radio sputter to give an inkling of what took place. And during the Hawaii war games, a PBY boat and its crew of six was swallowed by the Pacific in much the same mysterious fashion.

In the Aircraft Scouting Force's gruesome record is another accident—considered the worst heavier-than-air disaster in Navy history. In night maneuvers last February 2 near San Clemente Island, one bomber collided into the tail of another. Both spun into the sea, with a loss of 11 lives. Again war conditions were being simulated; lights had been extinguished. A sudden rain squall enveloped the planes in close formation, and the inevitable occurred.

A court of inquiry which investigated the fatal mishaps off Oahu brought out definitely, according to Rear Adm. A. B. Cook, "that there was no defective material in any of the planes in which loss of life was involved." And then he hinted at a change in the methods of operating these $200,000 bombers:

"We are going to need in war time at least three crews for every long-range patrol plane in order to carry out continuous operations, because otherwise the material will outwear the personnel."

And, say the Navy flyers who are still willing to talk openly, why wait until war time? If virtually continuous operations under almost impossible weather conditions are demanded in peace time, why not alternate the crews now?

They want consideration of physical limitations. They want the high command to realize that endurance has bounds, even if courage has not. They want positions of responsibility to which their years in the aviation branch entitle them.

They want to be bossed by men who know more about the actual operation of planes than they do.

They want ordinary principles of safety followed.

And they hope that the high command will consider these things so that the wives of Navy flyers may not, with each flight mission, consider themselves potential widows.

END

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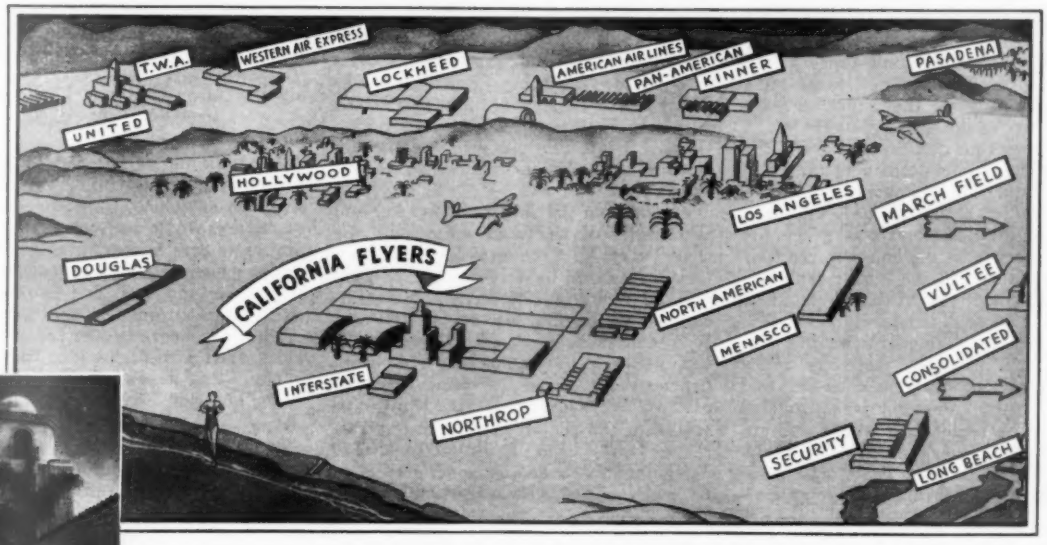

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Flying Stars

(*Continued from page 30*)

specified grades could command certain units. A major, for example, commands the flight test branch. A few new generals were created under the ruling that officers of this grade only must command the Material Division (Wright Field), the two foreign departments, etc. It all works out very well and more men are now entitled to receive the Brigadier-General's 11-gun salute than ever before in the air service.

Temporary brigadiers are jumped from the rank of lieutenant-colonel for a four year tenure of command, the purpose being to give as many men as possible the chance to learn the duties and responsibilities of an Air Corps general.

After the four years are over, the officer reverts to his permanent rank and waits his turn to become colonel and then brigadier again if the Fates and Army politics decree. He is given the choice, however, at the end of these four years, of retiring in the higher rank and at the retirement pay of that rank. If he reverts, he takes his chances.

An interesting sidelight to this decision which must be faced by every brigadier of temporary rank at the end of his tour of command was provided by Brigadier-General Henry C. Pratt, former commander of Wright Field. Shortly before General Pratt was to resume his previous rank of Lieutenant-Colonel, he was asked by this reporter during the course of conversation in Chicago, what he intended to do about it.

General Pratt said: "I am going to take my chances. Why should I retire now? The Air Corps is always expanding. You can't tell when new laws will be passed. I see no reason why I shouldn't revert to my former grade and possibly promotion will be speeded up some day and then it will have been worthwhile."

And so it proved. When the GHQ Air Force was formed, one of the first men selected as being eminently qualified by experience for the permanent rank of brigadier-general was Lieutenant-Colonel Pratt and he was accordingly elevated to the higher rank in permanent status.

Considering the subject of the pay and allowances of the men who wear the silver stars, let's see what an officer can look forward to by way of pay. In general, all Army officers have two classifications of pay. These are loosely described as base pay and allowances. A full general and major-general (with dependents) receive the same base pay of $8,000 a year and the allowances (classified as rental, $1,400; and subsistence, $1,080) bring the total to $10,520 per annum. A brigadier-general receives base pay of $6,000 and the same allowances making a total of $8,520. To these figures should be added the 50 per cent of the base pay allowed for putting in the required flying time. If, however, during one flying period of the fiscal year an officer doesn't get in his flying time, he is not paid for it and can not make it up in any succeeding flying-pay period.

The joker attached to the statute regulating the pay of general officers is this: the maximum allowance including "fogies" ("fogy" being the Army slang for the five per cent increase in pay allowed for each three years of service), rent and subsistence cannot exceed $9,700 for major-generals and $7,500 for brigadiers. When an excess occurs by reason of dependents, longevity, etc., the rent allowance is whittled. That's the law, anyway. A general makes so much, but doesn't get it.

In addition to pay and allowances, however, there are other appurtenances to the rank which, if reckoned in terms of money, would be very valuable. Generals rate cars and drivers, orderlies and various post services, a generous travel allowance and last and perhaps most valuable of all, medical and dental care. A major-general is allowed three staff aides, each with the rank of lieutenant or captain, and a brigadier is allowed two aides, both lieutenants.

It sounds pretty good until you begin to consider another side of the picture and then you must inevitably conclude that the keen competition, the terrific re-

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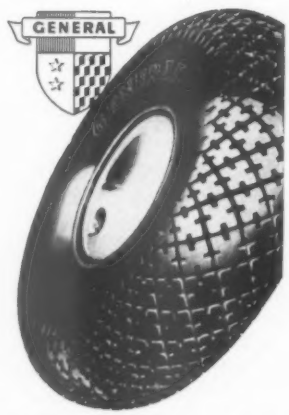

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sponsibilities, the grave personal risks of the job and the subjection to iron-clad discipline, with harsh penalties for violations of the Articles of War, make the rank very much underpaid in comparison with responsible civilian positions.

There are so few generals, but there are 1,000 civilians of even lesser age who are in salary brackets from $10,000 a year on up, for every $10,000 a year Army general.

Now, since we know something of the rewards and prestige and duties of Air Corps generals, let's examine still another side of the picture.

What chance do you or I have of wearing silver stars on our shoulders if we should be unable to attend the Military Academy at West Point, and enlist today in the Air Corps? The answer to this is the answer to the question of how much chance an enlisted man has of attaining high rank.

Becoming an officer in the Army out of the ranks is, to use Army slang again, getting it "the hard way". Just why it is so regarded is difficult to say. Most officers I have talked to seem to regard it as six of one, half-a-dozen of the other whether you rise from the ranks or graduate from West Point.

Any enlisted man who has the stamina and the untiring stick-to-it-iveness to qualify himself for the grade of second lieutenant, by studying and taking examinations, has unquestionably acquired as much of a military background and education, for all practical purposes, as has the West Point cadet. The education at the Academy is formal and systematized and expressly designed to produce officers in the shortest time and most efficient manner.

An enlisted man has the opportunity to become a commissioned officer if he wants to be one. The Army will help him in many ways and if he will take the time and trouble, and keep plugging at it, he can make the grade. From then on he is on equal footing with his brother officers and he has as much chance of climbing to the top of the ladder as anyone else. An Academy man has advantages, it is true, but examination of the records of officers who have climbed from the enlisted personnel discloses that, on an average, they have taken little more than four years to obtain commissions—just about the same time as the West Pointers. This applies, as we shall see, to the Air Corps.

Six of the entire list of Air Corps generals, past and present, were not graduates of the Academy. In some cases, there was some college background, but then colleges are not conducted in such a way as especially to fit men to become Army officers, consequently college men have about as many barriers to hurdle as the next man.

Two chiefs of the Air Corps, Fechet and Foulois, began their Army careers as enlisted men. Fechet took an A.B. degree at the University of Nebraska in '99 and was enlisted as a private in the Cavalry in 1904. He took an examination, after serving in the ranks and became a second lieutenant. In 1917 he was transferred to the Air Service, later became commanding officer at Kelly Field. He put his first star on his shoulder in 1925, barely 21 years after enlisting. He donned his second star as Air Corps chief two years later. This is approximately the same record held by Academy graduates in all branches and arms of the service.

Foulois, rejected by the Navy, was enlisted into the Army in 1898 and obtained his commission four years later. He entered the Signal Corps in 1908 and became the first airplane pilot in the Army. It took him only 19 years to get his star.

Billy Mitchell, taking his A.B. at George Washington University in '99, began simultaneously with Fechet to work toward the top, and it took him about the same time to get there. Brigadier-General F. L. Martin was a Purdue graduate but enlisted in the Signal Corps and was commissioned by examination.

At present the nation's 13 Flying Generals have the following dispositions: one Chief of the Corps, three assistants to the Chief, one commander of the G.H.Q. Air Force, and three Wing commanders (one each at March, Langley and Wright Fields) and two in command of the foreign departments, Hawaii and Panama, respectively.

That summarizes the situation in the United States today. You can draw your own conclusions.

END

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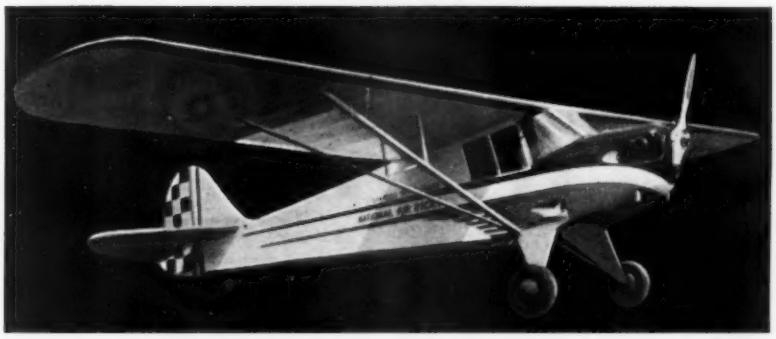

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Engine Compartments

(*Continued from page* 58)

and a shut-off cock. A steel spring supplies the seating force and it is obvious that a tapered seat is easier to keep tight.

Remote controls are used for operating the valves and the engine. Usually a push-pull unit, or a knob or handle that may be turned is used. Section 10 and Section 11 show some of the simpler designs. In case a fine adjustment is added, the push-pull unit is to be rotated.

The controls should be operated to open when the throttle lever moves forward, to advance when the spark lever moves forward and to open or "lean" when the mixture control moves forward. They should not only move in the correct direction but they should give the correct amount of motion required.

The controls should be kept fixed in the position they are placed. This is accomplished through friction, by intention or by poor workmanship—the result is the same.

Section 12 shows the principles of some of the standard controls. The first one uses the two-ball lock; the second uses a nut for adjusting the friction of the control rod; the third has a split housing with a tapered thread, and a nut compresses the shank. The fourth has a flat side on the rod which actuates a segment in an eccentric groove. When rotating the segment presses the rod against the shank and locks it.

The movement is transmitted directly by a rod, a wire encased in a flexible tubing, or through hydraulic pressure.

Another method, shown in Section 13, employs a flexible or rigid outer casing for a guide and a cable placed within a closely wound spring for transmitting the motion. The cable takes the tension and the spring the compression.

Section 14 shows a new design of creating and releasing the friction with a separate button held under tension by a spring. This spring pulls a chamfered rod that presses a steel ball against the casing. Pressing the button releases the pressure and the control may be set in any position without overcoming friction.

Section 15 shows a control held by the friction of a worm wheel, which will give a fine adjustment if the knob is turned. There must be enough friction on the worm wheel that vibration will not make the control creep.

The engine controls, the fuel system and the accessories open up a new field for inventors that has no direct connection with aero engineering. Simplified, standardized units, controls that have positive actions and added fine adjustments without backlash, all of them vibration-proof would greatly aid to make flying safer.

END

Letters

(*Continued from page* 58)

Help Wanted

Sirs:

Can you hook me up with some party that has a complete set of Waco "10" wings for sale? Also a complete tail assembly?

My plane was caught in a Kansas tornado.

J. E. DeVeise.

Ellinwood, Kansas.

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Sirs:

We have just opened . . . the Walling airport in this city (which) is located one mile south of Public Square on the Watertown-Syracuse highway. We have all the facilities for taking care of aircraft, day service only.

The reason for bringing this to your attention is due to the fact that this is the only airport having this service in this part of northern New York. The Watertown and Carthage airports are not operating.

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Watertown, New York.

NOTICE

"Airports at Sea," the article on American aircraft carriers originally scheduled for this issue, will appear in the next (October) issue instead. Unexpected production difficulties necessitate this change.—The Editors.

POPULAR AVIATION

Early Bird

(*Continued from page* 34)

during the month of February, many ducks, pheasants, quail and song birds on Horse Island near Gibralter in upper Lake Erie were deprived of food by the heavy snow and ice, the *Early Bird* dropped several tons of wheat, corn and buckwheat supplied by the Greater Detroit Izaak Walton League of America.

Time and again the *Early Bird* has proven her mettle by flying hundreds of miles, shooting pictures of fires, floods, murder scenes, festivals, boat races, political rallies and other events. Always she has returned with first-hand facts and first-hand pictures for her thousands of earth-bound readers.

No mention of the *Early Bird* would be complete without a few words about its crew. Donald Walker, pilot of the *Orion Special,* although young in years is a veteran of the airways with nearly 4000 logged hours. Don has flown everything with wheels and wings, including a national commercially sponsored tour in an autogyro. More recently, before joining the Detroit *News,* Don was employed by the Abrams Aerial Survey Corporation. His final assignment was an eight months' stretch flying a bi-motored Curtiss *Kingbird* mapping the Island of Puerto Rico on a government assignment. Don, embryo pilots will be interested to learn, spurns Dame Nicotine and her equally spirited sister, Strong Drink. To his intimates he confesses three great loves; his wife, his son and the *Early Bird.*

Equally devoted to the *Early Bird* is Tony Saley, wiry mechanic who has labored for the Detroit *News* these many years—since 1929, when the *Vega* was acquired. A native of Hungary, Tony is now a naturalized American and has few peers in the field of aviation mechanics.

The *Early Bird* is more than just another airplane. It is the most lavish, the most expensive, the best maintained news-gathering airplane in the world. More than that it is tangible evidence of a sound business institution's confidence in the airplane as an important servant.

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A Close One!

(*Continued from page 52*)

intending to swing in a wide spiral beyond the woods and drop down against the wind to land.

This was long before the advent of the slotted wing and to stall or get into a steep side-slip below 1,000 feet meant serious consequences to machine and occupants. However, we neither stalled nor side-slipped. But something did happen—something of which the cause and effect I have never been able to fathom. It was against all natural laws and for that reason I have placed it among the miracles. No book on aviation I have yet read has mentioned a similar experience.

The whole thing happened in seconds. But the myriad thoughts and actions crowded into that fraction of time not only left indelible impressions, but also proved how infinitely swift the human brain can work under the impetus of emergency.

It was not merely a severe bump, because I had been bumped severely on many occasions before that experience. Neither was it a drop into a downcomer.

Just a month previously, at Rozoy-sur-Marne, I had fallen into an air-pocket and I was the only thing loose in the plane that did not go by the board. Very lights, pistol, Lewis-gun magazines, emergency rations, and first-aid kit all went overboard.

No, the "miracle" was nothing so spectacular as a fall into an air-pocket but it was more terrifying, although anyone who happened to be watching from below probably saw nothing amiss. Yet, to arrive at the point, the old 'bus, for seconds that seemed eons, went *completely* out of control and at little over 200 feet altitude.

I will never forget those seconds! Some peculiar sensation in the plane's behavior made me turn quickly. I had been standing facing the tail as was customary for the observer in those days and, as I turned, I looked into the terror-stricken face of the pilot straining around towards me.

All that was visible of his features outside the helmet and goggles, was livid and his eyes started from their sockets, looking the more terrifying and grotesque inside the big fur-lined goggles! Wildly he swung the joy-stick right and left, then fore-and-aft in turn—but nothing happened! In desperation he kicked on right then left rudder and the old rudder just flapped helplessly around like a boy's kite in a calm!

Over the roar of the engine, his voice reached me, like the cry of a doomed man: "She's out of control! No weight on stick or rudder! We're done!"

Even if experience had not taught me the uselessness of trying to talk against an aerial engine, the circumstances precluded any attempt. Instead, my eyes darted like lightning to the airspeed indicator—zero! Desperately they sought the pitot tube—it was still intact and uninjured! Then, like the drowning man clutching at the straw, my glance caught the altimeter—hopeless!—under 200 feet.

An awful sensation surged over me. My hands clutched wildly at the fuselage and absolutely and literally, the saliva glands in my mouth and throat dried up. No flying speed. No control. Why weren't we hurtling to death on the green earth now so near? In that split fraction of time I thought of it, that expression we used in those days, "a sticky end" and we were in for for a very "sticky end"!

But that sticky end did not materialize. Why it did not, under the circumstances related, constitutes the miracle. Even as I stood spellbound with bulging eyes glued on the dashboard, the airspeed indicator began to swing slowly round and flicker in the vicinity of 80 m.p.h., the cruising speed of the D.H.9.

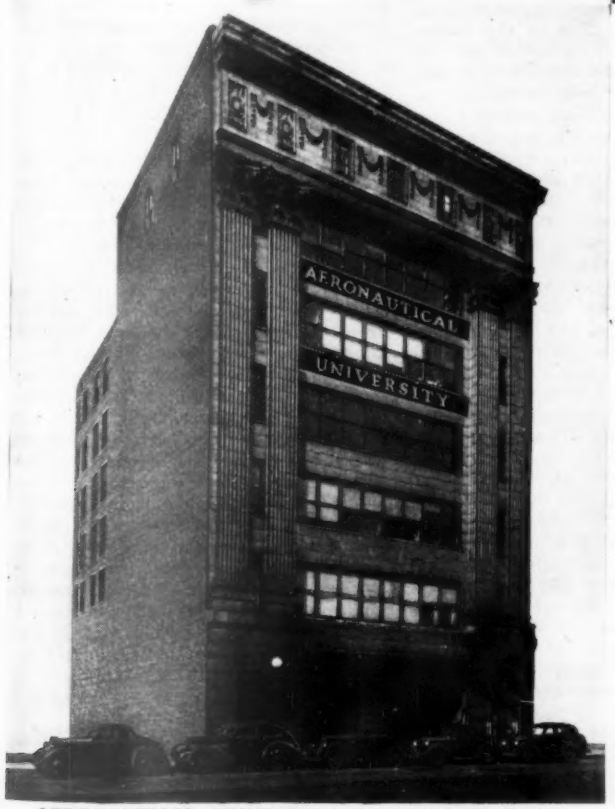
The pilot, still maneuvering the stick and rudder, felt the controls grip again as the plane took up its strangely interrupted course again. We had completed our circuit and then landed safely a few minutes later. As we faced each other before climbing out I said to the pilot,

"What happened, old man?"

Typical of those days, he just shrugged his shoulders.

"God only knows," he replied. Then in silent gratitude to a loving providence we shook hands over the lucky escape.

END



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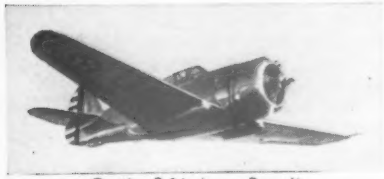
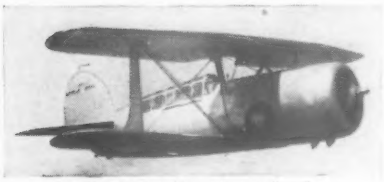


Curtiss P-36 Army Pursuit



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Warden With Wings

(*Continued from page 42*)

There are times, too, when fish conservation becomes fisherman's conservation. Last summer, a fishing party went some 80 miles into the big woods by canoe. There one of them, an 18-year-old boy, was stricken with appendicitis. To have carried him out by canoe would have taken more than a day, because of the necessary portages. One of his companions tramped overland to the nearest warden's post and telephoned headquarters. Ned Hutchinson got the report of location, flew to the spot, landed upon an open stretch of river channel, loaded in the sick boy and rushed him to the nearest hospital, where a surgeon waited to begin the operation. The boy recovered.

On wings or afoot, a game warden must be never-endingly alert to poaching. And in matters of poacher-catching, a warden in the air is far safer than a warden on land or water. Poachers are frequently vicious, career criminals.

Last winter, during the heaviest snow period, North Maine game wardens reported a typical outbreak of beaver poaching in a back province where the state game commission is making an outstandingly successful effort to restore beaver. While the backroads were blockaded by snow and wardens were extraordinarily busy with other chores, a team of French-Canadian trappers began to pillage the beaver crop.

They would tramp on snowshoes across the Quebec line to the Maine beaver ponds, carrying small tins of chloroform. The poachers would then use handaxes to cut holes in the tops of the beaver "houses," dump an opened tin of chloroform into each hole and seal up the vent. Next day they would return and take out the entire beaver family—dead from anaesthetic.

The beaver pond is more than 50 miles from the nearest warden post. Matched on snowshoes, the two poachers managed to keep out of reach of the one resident game warden. So the air warden took over the job. First, Ned cruised low over the beaver pond until he had located the trails of the poachers. Then he circled and returned and followed the trail until he caught the team redhanded in villainy. Then he made a ski landing, took up his rifle, arrested the murderers of beaver, handcuffed them and flew them back to justice. Both drew heavy fines and prison sentences.

Ned finds, too, that when you're an air warden, you must watch out for other airplanes. More and more poaching is being carried on by plane. Winged poachers sometimes fly over the big woods, stage pontoon landings on particularly fine trout waters, fish out the streams and fly away with the catch.

Venison running by air is another timely fashion in wild-life robbery. Flying poachers dart into the big woods during any fall or winter month when deer meat is good, land a party of hunters who slaughter deer wholesale, usually in winter yards, then load the most choice "saddles" of venison into the plane and fly it out to city market.

A good sturdy plane can carry as much as 1,000 pounds of venison at a load. Out of season, such a cargo is probably worth $500 or more at a city market. Last winter, one air-minded crew of venison pirates was broken up after they had run tons of illicit venison into the Boston market.

So goes the life and work of a warden with wings. As a field of aviation, it is perhaps the most versatile known to man. Few days suggest what the next will bring. Mixed with the chores and adventures of conservation are those of defense, law enforcement, mapping and scouting, fire patrol, plain and fancy draying, errands of mercy and snipe hunting. You've got to keep a sharp eye and a steady throttle hand, charge the batteries strong, keep both fuel tanks full to float level and stand ready for practically anything.

A swimming pool or an ice pond may be your landing field. You must read your way with one eye on a highway map and the other on the port window. It's a game of black, blind flying and forced landings. If you get lost, you read your instrument board, take out your celluloid compass protractor and pull a string across it. If the motor misbehaves, you circle for the nearest water and hope for nothing worse than a cold night on an unmapped pond. To date, Pilot-warden Ned Hutchinson has put in more than 500 flight hours and made hundreds of forced landings and take-offs without a crack-up or even a minor mishap.

George J. Stobie, Maine's commissioner of inland fish and game, wears horn-rimmed spectacles, towers head and shoulders above an average-sized man, grins at you while he talks. Stobie is a convivial gentleman who destroys liquor heroically and entertains profound skepticism of all mortal knowledge. He has spent an independent lifetime in game conservation; his counsel is probably more sought after than that of any other game authority in the world. Canadian Game Commissions and the U. S. Biological Survey virtually worship at his size eleven D feet. Inland game and fish are the greatest wealth-bringing resource of Maine, and besides being absolute boss of 108 uninformed wardens, Stobie is nearest boss of the belligerent Maine legislature. Independently wealthy, he has supreme disdain of salary vouchers and political horse trades.

He has similar disdain toward mortal knowledge of wild life. He doesn't believe that any man living knows one percent of what any man ought to know about the subject.

But with all his stores of scientific doubts, the Commissioner is certain that use of aviation in game and fish conservation is justified. He had previously chartered planes for special survey work. Last year at Boston, when

he saw an undergraduate tycoon from fair Harvard land a sparkling new red plane very badly and smack a wing against an airport tower post, Stobie strolled up and bought the damaged plane, had it repaired and introduced the flying warden.

As a transport, the one plane almost doubles the actual working value of the entire warden force. It is saving thousands of deer and moose from winter starvation, putting the brakes to several meanest forms of poaching, helping reduce fire losses—the most ruthless of all natural enemies to forest life.

What is still more important, it is shaping a better background understanding of the actual living habits of valuable game animals, a basic understanding which has heretofore been pitifully limited. This, so Stobie says, is aviation's most commanding place in the ever-growing picture of conservation.

Ned Hutchinson agrees with these sentiments. He's a flying man and not a talking man. He knows, however, that work flights in the big woods give a man plenty of opportunity for first-hand acquaintance with actual ground and water surfaces. Impromptu drop-in calls on furry friends reveal the real personal and domestic sides of their lives.

Your wrong notions are undeniably corrected. You shortly discover that a great many of the so-called mysteries of wild life aren't. Most native animals are a rugged and self-provident lot, far hardier than domestic animals. Deer can wax fat on a range where either cattle or sheep would starve. Wild ducks and geese can flourish and multiply on half the fare of their domesticated brethren.

You blunder upon instances of wild life heroism which make the movie thrillers look like thirty cents. You may see a cock pheasant gouging his spurs into an attacking fox. You will see beavers performing feats in dam building and water control which any mortal engineer could envy. You will see native birds keeping to air routes which apparently do not vary 50 yards during the course of a century.

You will notice that wild life enjoys frolic and play the same as people do, and that loving, fighting personal rivalry and jealousy are as much a part of forest life as they are of city life. You find that at least during mating season, bucks are more belligerent than bulls; that moose are dictator-minded; that beaver are fierce fighters among themselves; that bear are probably the most completely treacherous of beasts and that the fox is nature's own original gangster—one of the few beasts which kills for the mere vicious delight of killing.

The pilot-warden has gathered conclusive evidence that female raccoon, mink, and several other valuable fur bearers have the cannibalistic habit of eating their own young when they become suddenly frightened. He finds, too, that the famed snowshoe rabbit, supposedly one of the most timorous of all creatures, is a veritable hellion on home grounds. Buck rabbits frequently fight to the death.

Plane duty also suggests that as a general rule, tended woods are a better retreat for game than is virgin forest. Earth which is densely shaded by big trees rarely ever grows the grasses, berries, and graze best suited to the support of deer and moose or the more valuable game birds.

We cruised low over the beaver preserves of the upper Allagash. Here one sees numerous gaps in the dense sapling growth. Beavers feed upon the nourishment contained in the wood, use sticks and tiny logs to dam an unending abundance of surface water. Luxurious grass surrounds the cavalcades of ponds. A speckled faun grazed at the water's edge. But Ned Hutchinson was studying his instrument board. "We've got to take on gas."

He lifted, headed high over the tall timber for Moosehead Lake. There we landed and coasted for the lone gasoline dock. But the water was too low for a push-in. So we anchored, and waded out for a long, cold portage.

The pump boy poured out the 70 gallons in five-gallon cans. One after another, we toted out the 14 cans, hoisted them atop the wings, set the strainers and filled the gluttonous tanks. Then we remounted and took off—for another aerial visit with Nature.

END

Man Under the Hood

(*Continued from page* 54)

. . . Fifty-nine pilots soared a total of 418 hours, 32 minutes—that's 17 days, 10 hours, 32 minutes if you hadn't noticed. . . . They covered 5,841 miles in this time. . . . **Peter Reidel,** transport pilot and veteran European soaring enthusiast, made one flight of 225 miles, and four other flights across country for distances ranging between 103 and 196 miles. . . . Our own boys did pretty well too. . . . My one objection is that there were too many imported soaring planes in the contest. . . . I'd like to see a dozen or more American ships in the high performance class.

* * *

The **Army Air Corps** has just called for bids by manufacturers of light aircraft for construction of a tiny radio-controlled target ship. . . . The plane is supposed to have a speed of 150 m.p h. at 10,000 feet. . . . And it should be launched by catapult or from a conventional landing gear. . . . Ostensibly these planes are intended for anti-aircraft targets and will be flown by a radio operator from the ground. . . . But our friends tell us the **Army** also is considering the use of these planes as controllable aerial bombs that can be dived into their targets. . . . Sounds a little like Buck Rogers, but after all the **British** have been doing it for nearly two years.

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. . . THAT the giant new 74-passenger Boeing 314 Flying Boats now under construction for Pan American Airways are powered by four 1500 H.P. Wright double-row Cyclone engines.

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. . . THAT the passenger decks of the new Cyclone powered Pan American Airways' Clipper planes are divided into nine separate sections. Five of them are standard passenger compartments, accommodating ten passengers each, the sixth is a half-size compartment for four passengers. The center section is a large room which may be alternately furnished either as a lounge or a dining salon. The aft section is a deluxe compartment which may be used as a bridal suite.

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AIRPORTS AT SEA

Although everyone knows what an aircraft carrier is, not many realize just what goes to make up one of these huge floating air bases. POPULAR AVIATION has been fortunate in obtaining an exclusive, revealing article that describes the inner workings of an American carrier. The author is an authority on Naval aviation and is on duty with the Navy's Bureau of Aeronautics in Washington. Don't miss this authoritative article, "Airports at Sea" by J. B. Hancock. One of many features in the big

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We Don't Fly for Love

(*Continued from page 26*)

likes to feel romance and not one of us want to die wondering what it's all about.

As for myself, I don't want to marry some wealthy old gent who took a fancy to me because I was a dainty fixture on a $100,000 airplane. Perhaps I won't have the chance. But I'm so wrapped up in this flying business that my preference, I feel, is going to be some bright lad who is part of the business. He may be a pilot. I don't know though. The pilots marry a lot of stewardesses every year and that can't go on forever without a little bigamy sneaking in. But this aviation business is young and there are a lot of young, eligible men in it. Some real down-to-earth fellows, too. I don't want to marry the president of the company, either *(Note: He's already married)*. The man I marry is not going to be gauged by the job he holds or his comparative ability. When I first came to work, I felt a deep affection for a pilot with whom I flew a great deal. In a few months I realized I was going in for a bit of hero-worship. He is a brainy gent with a lot of ability. He handles an airplane in the way I want to handle a baby carriage some day. He's handsome, too. But it wasn't love—just infatuation.

The funny part of it is that to this day he never suspects that I really did care for him and had he returned my affection in those early stages, I might readily have been very receptive to him. But now I get my 85 hours of flying a month and the publicity department says I fly about 120,000 miles a year, so I should be just as glamorous a person to the pilots as this man was to me.

But gosh-darn it, I've met a flock of good-looking men in this business and men who are going places. That's the kind of a man I'd like to tie on to, rather than some man with gray hair who has already spent the best years of his life. I'd rather climb the ladder of success side by side with a man rather than be dragged up by the seat of my pants. Sure, I admit it—I'm going to be married some day, but it's going to be a few years yet before I get stewardessing out of my system and start considering any man. Perhaps the editor will invite me to jot down a few notes a year from now so I can tell you what my heart interest is.

As for today, my heart interest is quite varied. I have no steady boy friends. I'm not ready to settle down to a "steady" right now. Three or four nights a week are spent out of town, and I certainly don't want to sit in a hotel room and knit until my trip is ready to go back. You're right—in my time off I like to get caught up on my dancing, smoke four or five cigarettes, hear the news of the town and nurse a glass or two of beer. Or if I'm on a night trip, I want to get out and take on some sun at a beach, or beat some co-pilot at tennis. (Not that I ever have.)

I've been pouring out my thoughts here at random. I know what subjects whirl through my brain while the typewriter keys are clicking. Let's take a peek at my thoughts while flying. Perhaps I admire some shapely girl in the forward seat who's just made a big hit in the movies. Or it's fun to promote a smile from a babe in arms who's traveling across the country with his maiden aunt. What a joy it is to feed a little tyke at 10,000 feet. Some day I'll have one of my own (or did I say two)?

The next passenger I see is a clothing salesman—from Brooklyn, I'll bet. He's just the type who'll pull out a long black cigar and start puffing on it. He's the gent who'll want to rush you from the airport to his room—prelude-to-seduction is the label I have for him. I know this gent is married. He's probably told me at least ten times in the last hundred miles about his wife. And yet he is already painting pretty pictures about the view from the lake from his window and how nice cognac goes with a demi-tasse. This guy has already mentally sized me up and I'd like to bury my nails in his eyes. Instead, I just let him down easy so as not to make an enemy for the company. However, I can still treasure the hope that "my man" will never be the deceitful wretch that this man is.

I've learned a lot about men from stewardessing and hope some day I can make this knowledge profitable. How or why I don't know. I'm sold on the idea that very, very few men have but one love in their life. Perhaps the first comes at 16 and the next at marriage, but I hope the man I get will be mature enough to avoid the commonness some of my passengers have stooped to.

If you've read this far you are probably saying that this gal has written a lot about stewardesses, but has said nothing about their work. Well, if, when you started reading this story, you expected to read how long it takes to serve a meal and how many sticks of gum are passed out daily, you didn't read the title. The editor said the title would be something like this: We Do or Don't Fly for Love.

Well, we may not fly for love, but we certainly love to fly—if you know what I mean.

END

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POPULAR AVIATION

Blimp Tailor

(*Continued from page* 50)

"As the balloon fell in flames, C. E. Wollam, my co-pilot, fastened a parachute harness on my unconscious form, and tried to hoist me over the side. When this proved impossible, Wollam, himself, bailed out, hoping the remaining balloon cloth might form a parachute within the net and check my descent. And that is just what happened. Except for lightning shock, burns, a broken arm, and four broken ribs, I was all right, and back at work within a year."

J. A. Cooper is a West Virginian by birth. He is 53 years old but looks younger.

The story is told of his early days of his balloon tailoring, that when new designs were decided upon, this stocky man with the unruly hair would usually find a vacant room somewhere and work day and night to get the new type balloons finished even before the engineers had completed their calculations and before their last blueprints had had time to dry.

Men in those days called Cooper a "practical genius." For many years Cooper has had charge of the balloon room at the Goodyear Zeppelin factory, and at present he is at work on the bags for two Navy blimps which are being built by the Goodyear Zeppelin Company for use at the training station in Lakehurst, N. J., as well as on more of the new type C-6 balloon for the Army's experimental purposes.

Both men and women are employed under him at the Goodyear balloon room, where the big bags are laid out on the floor and cemented together by workers who must go about in their stocking feet for fear of harming the fabric. Careful tests are made on each minute part of the bag before it is sent from the factory. To make these tests one of the workers stand on one side of the cloth, while other workers with electric light bulbs pass outside of the cloth, spotting any places which may seem weak. END

There's Plenty to Do

(*Continued from page* 14)

ing to the Command and General Staff School at Fort Leavenworth next year. Supposed to be a high-powered school. Fitted a fellow for staff duty. Staff duty with what? With some ground outfit? Give me the Tactical School, a real Air Corps school for an Air Corps flyer. Maybe the Command and General Staff School later on in my career. But the Air Corps was the branch to be in, wasn't it?

"Every day in the Army is like Sunday on the farm." Well, maybe and maybe not. But not in the Army Air Corps, at any rate.

And hastily our hero goes forth for another several hours flying to earn his monthly pay check.

END

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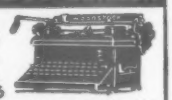
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I Fought in Spain

(*Continued from page* 12)

volunteers fighting for the government, and they were credited with some of the most outstanding work of the whole war, so we at least knew that there were some Italians who could fight.

Many questions have been asked about the methods of observation used in the Spanish war, also about the types of planes used in such work. The general trend of my answers to those questions will undoubtedly be rather disappointing to those who happen to believe in the use of planes designed solely for observation purposes.

When I first arrived at the Madrid front the enemy was using a plane so designed, but it wasn't very successful. It was a single-motored Heinkel known as the *Paloma Blanca* (White Dove on account of its color) and carried a crew of three men: pilot, rear gunner, and a combination observer and cameraman. They did fairly well as long as there was a solid layer of clouds in which they could seek shelter if attacked, but as soon as the clouds thinned out and finally disappeared altogether, they were useless. Our monoplanes could catch up with them long before they could reach the security of their own territory. We never saw a single one of them after about the first of April. They were used a little bit over the front lines but they never ventured very far back in our territory. After the first of April the enemy used bi-motored bombers for their interior observations.

We used a sort of a double method in our own observation flights. For observation of areas within about 15 or 20 miles of the front lines we used our biplane fighters—for anything beyond that we used our fast bi-motored bombers (Katiuskas).

The advantage of this system was that the enemy anti-aircraft batteries were usually more or less concentrated in areas close to the front lines and our fighters could get much closer to the ground than the Katiuskas and still manage to keep clear of their fire. On several reconnaissance flights we actually flew under 500 feet and still returned with our reports. At that altitude the A. A. guns were practically useless—the gunners seemed to have trouble setting their fuses for such short distances—and the A. A. machine-guns (.50 caliber) fired such heavy streams of tracer that they could actually be seen in time to evade them (that was where our maneuverability came in handy). Camouflage was usually better near the front, too, but at that altitude we could make out anything of importance. We could also take time out to machine-gun any enemy convoys we happened to run across.

Our biplane bombers had a cruising range wide enough to fly to any part of Franco's territory and return with gasoline to spare. They usually covered the enemy's heavy bomber fields, which were usually located far back of the lines. They also kept their eyes peeled for any signs of supply depots or munition dumps. They carried radios so that even if they were shot down they could still get their information back to headquarters up until the last moment.

Another subject about which many questions have been asked is that of ground strafing. Here, again, the answers will prove to be disappointing to the supporters of attack planes. We had planes (Rasantes) which were equipped with ground strafing guns, but they were primarily light bombers. They were very slow and flew at too high an altitude.

All effective work of that sort was done by our fighters. We could come down in a dive and, at the bottom, have sufficient speed to maneuver around and dodge anti-aircraft fire. Fifty caliber anti-aircraft machine-gun fire would almost certainly be effective against low and straight-flying attack planes. Our present-day Army attack planes are entirely too large to do any maneuvering. We could maneuver a patrol of *three* of our biplane fighters better than one of them could hope to do.

The last subject on the list concerns the effectiveness of anti-aircraft gunfire. As far as I could see—and that was the general consensus of opinion of my fellow pilots—its principal effect was to demoralize new front-line pilots. In all of the time I spent over there I saw only two planes brought down by anti-aircraft fire. Both of those were brought down by direct hits—which seems to prove that the archie gunners still have to depend on luck for their victories. Of course, time after time we returned with shrapnel holes in our planes and pilots—but we still *returned*. Which proves that modern archie shells still have plenty of room for improvement. In most of those latter cases a few minutes' work by a mechanic with glue and patches—or by a doctor—would be sufficient.

During the Brunete offensive directly in front of Madrid, the Fascists were using the latest types of German rapid-fire guns against us. They were very similar to the "secret" British pom-pom. We made several flights every day for about two weeks and were fired upon every time we crossed the lines. Yet, they managed to bring down only one plane—and that was a direct hit upon one of our monoplane fighters which was making about 300 m.p.h. at the time. All in all, I would say that anti-aircraft fire is not nearly as effective as our United States anti-aircraft advocates would have us believe. The best defense against enemy planes still seems to be to "old-fashioned" fighting planes—especially when they are of American types.

In closing, I might say that if American plane manufacturers uphold their present standards, we need never fear invasion by foreign aircraft. The only country in the world which has planes which can even hope to compare with ours is Russia—and their planes are merely copies (and, in some cases, developments) of our planes. In fact, from conversations which I have had with Russian political representatives in Spain, I have good reason to believe that we have a secret military agreement with the Soviet Union.

END

Such Interesting People

(*Continued from page* 44)

car and was rushed to New York.

The other reporter, a bit peeved at missing her, sent out a story that she had narrowly escaped death by ducking under a revolving prop. This was untrue; she was nowhere near it. But papers all over the country carried banners about "Hepburn narrowly escaped death."

To prove how convincing a news story can be, the same reporter, later employed by the Associated Press, interviewed Miss Hepburn and reminded her of the Newark incident.

"Yes", said the actress, "do you know I was nearly decapitated by a whirling propeller that time?" She actually believed it herself!

One of the "pains in the neck" to reporters is the two-time Motion Picture Academy Award winner, Luise Rainer, Miss Rainer, a fine actress, is poison to photographers and reporters. She runs by them and refuses to talk or pose. Once she claimed to be her own maid. It is only recently she travels under her own name. She arrived at Newark one afternoon and ran for the car. As luck would have it the car was delayed and I got a chance to talk to her.

"Listen, Miss Rainer," I said in my best pleading voice, "why don't you be regular and talk? Don't you realize this is our business? Don't you know publicity is your life? Without publicity you could never be the great box-office attraction you are. Making friends is your success. We want to help you . . . we don't want to do you any harm . . . won't you say something?"

Luise turned her big expressive eyes on full force and handed me . . . a gardenia!

Ricardo Cortez, the movie actor, is swell copy. Not only is he friendly, but has a marvelous memory. He even remembers reporters' names and tells them who is booked out of Hollywood in the near future. I always stretch a point to give him a break. Douglas Fairbanks, father and son, are willing talkers. So is Mary Pickford and her Buddy Rogers.

Clark Gable thinks nothing of signing autographs until his hand must ache. Randolph Scott makes friends easily.

Wally Beery, a pilot himself, acts gruff, but really isn't. He'll pose for pictures—but not in front of an airline ship.

"I pay for my ticket," he says. "I'm not advertising the air lines."

Robert Wadlow, the Illinois giant who came on to join the circus, was met here by the late Dexter Fellows and a corps of press agents. They were afraid the huge youngster might be shy. He wasn't, but he resented being called a freak.

Young Vittorio Mussolini, son of Il Duce, didn't mind posing for pictures, but he was conscious of his poor English and wouldn't talk. All he said was "Tek away de hoss" when a mounted police officer got too close to him.

The Roosevelts, from Eleanor right on down, are fine copy. Mrs. Roosevelt will always talk and James poses freely with any of the other passengers aboard the plane.

Governor Hoffman of New Jersey, during the famous Hauptmann trial, was much sought after for interviews. A former reporter himself, Hoffman never tried to avoid interviews, but he was a master at changing the subject. All a reporter ever got from an interview with Hoffman was a collection of new jokes.

Wrestlers are always willing to talk, but they seldom have anything worth while talking about. Fighters either try to ape Gene Tunney or strut importantly down the gangplank. Tommy Farr, the Welsh heavyweight, while friendly and jovial, never makes any important statements. The reason for this, we learn, is because he carries an English reporter with him to keep him from "spilling the beans."

Dr. Hugo Eckener, commander of the ill-fated Hindenburg, speaks little English, but if the reporter understands German, he'll talk blimps all day.

Reporters do meet interesting people . . . some day I'm going to buttonhole a celebrity and say:

"It must be wonderful to be a celebrity . . . you meet so many interesting reporters!"

END

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1x2 ....1 for 8c
2x2 ....1 for 14c
2x3 ....1 for 21c
2x6 ....1 for 35c

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2x2x1 .....2c
2x2½x1 .....3c
3x3x1 .....5c
3x3x2 .....8c
3x3x3 .....10c

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1/16x⅛ 35 for 5c
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1/16x¼ 15 for 5c
1/16x½ 5 for 5c
3/32x3/32 30. 5c
⅛x⅛ 30 for 5c
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⅜x1¼x10 2—5c
¾x1¼x12 3c ea.
1 x1½x12 6c ea.
1 x1½x15 7c ea.

WHEELS per pr.

Brch	Bisa	Celu
½	.01	.03
¾	.02	.04 .05
1	.03	.05 .07
1¾	.04	.07 .10
1⅞	.06	.09 .16
3	.12	.30

PROPELLERS
Balsa Paul-O-Mach. Cut Wina
5" 4c 10c
6" 5c 15c
7" 6c 20c
8" 7c 25c
9" 8c 30c
10" 8c 35c
12" 10c 45c
14" 14c 55c
15" 15c 60c

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1" pr..... 6c
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1/16", 3/16", ¼" ...10c ft.
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2 Sheets for 1c
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DOPE Colored
1 oz. 5c ½ pt. 30c
Thinner same price as clear dope
BROWN RUB. Best quality
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Skein 225 ft...65c

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12x16 .....15c
RUBBER LUB.
Large bottle 10c
MICROFILM
2 oz. 25c
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Grade A, sq. yd. 45c
Plastic Balsa
For cowlings, streamlining, repairing, etc. Large can 25c.
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6-8-10-12-14 ..... 2 ft. 1c
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An Airy Chat with the Editor

(*Continued from page 9*)

ONE thing that is lacking this year, in this office anyway, and that is the conventional mystery ship that makes its bow to the public about this time of the year. Of course, the Army and the Navy have their mystery doodle-bugs as per usual, but the great big inventor that represents advanced thought in the milling millions is sadly missing from the picture, this year.

* * *

METEOROLOGY, being one of the speculative sciences, is limping along about as usual. I've got soaking wet three times this summer by listening to some scientific weather prophecies, all of which registers me as a member of the Doubting Thomas Club of Chicago. When this science is developed to the point where a guy can look at a dial, move a slide-rule back and forth a few times and then venture outdoors without an umbrella under each arm, I'll say that the science is perfected — that's what!

* * *

EVEN with a dozen radio communications between the various towns on a projected line of flight, direct telephonic communication and with a flock of Weather Bureau maps, the pilots consistently fly into all sorts of unexpected weather disturbances, just as if meteorology were non-existent. Old Man Weather isn't licked yet, drat him, regardless of what the big shots say.

* * *

AND that brings to mind the remark of a physician that may be of use to our airline pilots. He said that adventurers who become exhausted with hunger and thirst in the wild places of the earth, die of acidosis or from an excess of acid in their mechanism and, that if such prospective victims would alkalize themselves with an alkaline preparation that they could prolong their lives two or three days. We submit this thought to pilots who may have a crack-up in the mountains where food and water are scarce and where the walking is tough. Alkalize and perhaps you will live long enough to be picked up by a search party—and perhaps not.

* * *

PERHAPS future air service regulations will carry a paragraph requiring that every cockpit be equipped with a big can of sodium bicarbonate, powdered magesium carbonate, or the like.

* * *

AND then, thinking over this matter seriously, a gasoline-propelled scooter might be of assistance to the sodium bicarbonate in gaining assistance from the outside world. One could be carried without much trouble in every ship, just as a lifeboat is carried by an ocean liner. It's not really a joke at all. It would save a lot of walking.

* * *

THERE'S been a lot of discussion during the past year as to the relative merits of lady hostesses and male stewards. There seems to be no argument at all so far as we can see. The public likes and admires the lady attendants and would, we are certain, prefer them to the European type he-hostess with his bob-tailed service jacket and silly simper. We're strong for the gals.

* * *

DO you remember the oldtime leather-necked pilots who swore by the gods that no man or corporation could get them into a monkey suit with brass buttons and a cap with an airline advertisement on it? Well, times change. and I met an oldtimer the other day that outdazzled John Philip Sousa with the brilliance of his array. He was a cross between a Swiss admiral and a Gold Coast doorman with enough brass trimmings to sink a ship—and they made him like it!

* * *

BILL JONES remarked that he looked like a 1916 Rolls-Royce except that he carried no guarantee.

* * *

WONDER what became of that safety gasoline that was so loudly proclaimed a few years past. In the supply tanks it was not inflammable, but when it reached the carbureter the "safety" was removed and it became normal explosive gasoline. I wonder if the inventor was blocked by the refiners or because he couldn't finance the scheme. It worked and good valid demonstrations proved it.

* * *

THERE are now two objects in the young man's mind when he thinks of California. One is to enter the movies (first place, of course) and the second is to enter the aircraft industry which is now booming on the coast. About the same advice can be given for either brain storm. Your chances in the movies are better than to get a profitable job in a West Coast factory—practically nil we might jolly well say. If you really know aviation—swell, but if you don't, hang on to that grocery store job a little longer, or go to an aviation school.

* * *

DOES private flying come under the head of sport, a hobby or an avocation? That's what we'd like to know. So many private flyers work so diligently on their ships, and so seriously, that it takes on the appearance of a job at zero salary. But even more occupied are the army of arm-chair pilots, airport peewees and the rest of them who spend their waking hours, when off the job, identifying a Palooka PBA-2145-UB from a Hoozus 9-49-CCX. The former fans work all day and the latter work all night. But it's a great hobby no matter how or wherefrom you look at it. In fact, I know several fellows who have gotten so good at it that they can rattle off the names of passing planes like nothing at all. All they have to see is the speck high in the sky. What a sport!

END

National Air Board

(*Continued from page 30*)

strongly in favor of the bill, but thought that the composition of the Authority was a matter of great importance. The Authority should include a legal member to assure a truly judicial attitude in its hearings and decisions. The Authority should be as far as possible non-partisan in character. It should contain one member well versed in air transport, one an authority on airports and airways, one equally well versed in aircraft manufacture, and one interested in private flying, non-scheduled flying and aviation training.

A Telegram to the President

Finally sentiment crystallized in the following telegram to the President:

THE NATIONAL AIR BOARD RESPECTIVELY URGES THE SIGNING OF THE MCCARRAN-LEA BILL FOR THE CREATION OF A CIVIL AERONAUTICS AUTHORITY AND THE APPOINTMENT THEREON OF MEN WELL VERSED IN THE MAIN DIVISION OF AVIATION SUCH AS: TRANSPORTATION, AIRCRAFT MANUFACTURE, AIRPORTS AND AIRWAYS, PRIVATE AND MISCELLANEOUS FLYING, IN ADDITION TO A LEGAL MEMBER EXPERIENCED IN AVIATION LAW. SUCH A REPRESENTATIVE BOARD APPEARS ESSENTIAL TO THE BEST FUNCTIONING OF THE AUTHORITY WHICH WILL HAVE SUPREME IMPORTANCE FOR ALL OF AMERICAN AVIATION.

A Resolution in Memory of Senator Copeland

It was only fitting to recall the great services which Senator Royal S. Copeland had rendered to aviation safety in the following resolution:

Resolved: that this Board expresses its regret at the death of Senator Copeland who has shown such marked interest in aviation safety for so many years and has rendered it such signal service.

A Letter on Supercharger Development

Mr. J. C. Miller of the General Electric Company has written us a letter on supercharger development, which epitomizes the subject so well that it is reproduced here in full.

"As I told you last week at the luncheon of the Air Board, I am giving you, herewith, some of the history and a report on the present state of development of superchargers for high altitude operation, as well as a brief resume of some of our other developments which appear to have particular value on projected large aircraft.

"As you probably know, our exhaust-driven supercharger development dates back to 1918 when we were requested by the Army Air Corps to develop an exhaust-driven supercharger based primarily on the work that Rateau had already done in France.

"This development moved very slowly after the War and I think a great deal of credit is due to the foresight and initiative of the Air Corps authorities in keeping this development alive during the many years when it was freely admitted that it had no immediate practical application.

"With the advent of airplanes with greater speed range, variable speed propellers and other related items, the turbo supercharger becomes almost a necessity when operation at altitudes of 20,000 ft. and above is contemplated. The turbo supercharger is assuming a position of constantly increasing importance for military work, particularly for bombing, pursuit and reconnaissance. You will appreciate, of course, that I am not at liberty to go into any detail in connection with the military application of this form of supercharger, since this project is still placed on a restricted status by the Government.

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Adventure in 1912

(*Continued from page 45*)

began payments on a correspondence course in the "principles of aviation and their application." The course was just what the title had promised, the principles of gasoline motors, a theory about why birds are able to fly, a thesis about aviation's future, and a history of the first few years of man-made "birds."

In April, 1912, after diligently poring over airplane sketches and pictures for six months and learning what to do if the exhaust from a Hall-Scott was "erratic and belched black, carbon-laden, smoke," I enrolled in the Standard Aviation School in Chicago—address, Clearing, Ill. The school was at the approximate location of the present municipal airport, Cicero avenue and 63rd street.

This school, like a good many others at that time, was a fake at the time 12 of we "suckers" enrolled. But we didn't know it for several weeks. The Clearing field was one of the best in the country. The Standard school had constructed two hangars about 40'x100'—modern and gigantic at that time. A home-made Curtiss sat in front of one of the hangars, and the other housed a Maximotor mounted on a cement block. We thought we had chosen a better school than the Curtiss school, the premier one in 1912.

One month of ground work and theory lengthened into three, and the 12 enthusiasts who had invested over $1,000 apiece began to wonder. The Curtiss plane had never left the ground, and the instructor evidently knew only what he had learned from a correspondence course and couldn't fly a kite himself. Finally two of the fellows with a little money consulted a lawyer and started suit against the Standard Aviation School for false advertising—or something. That did the trick.

In the latter part of May a "genuine" instructor took charge. Otto W. Brodie, a true pioneer who had been one of the first six men to learn flying at the Curtiss school, took charge of Clearing field, assisted by his mechanic, R. W. "Shorty" Schroeder (now United Air Lines' vice-president in charge of operations). These two men made Standard school's field a popular hangout for aviation "dopes" and luminaries. Every night after instruction the gang from Cicero and Grant Park field would come over to "Dad" Burton's Bungalow Hotel to bull-fest about the thing we were all interested—aviation.

"Dad" never flew, but his smoky lounging room was the stamping grounds for such important figures as the Clearing postmaster, an Illinois Central railroad engineer, Tom Cole, a men's tailor; "Christy" Christenson who later went to Lincoln, Nebraska; Lincoln Beachey, who later crashed in California; "Sure Shot" Kearney, who disappeared off the California coast; Howard Gill, who was killed in a collision with another plane above Cicero field; Paul Peck, victim of a spin; Andrew Drew, crashed; and Glenn L. Martin, now a prominent manufacturer of such ships as the *China Clippers*.

Later, after Shorty Schroeder's idol, Otto Brodie, was killed in a crash, Shorty set out to make aviation a safe and legitimate industry. He did, and in so doing became one of the best-informed men in aviation today. He has been chief of the airline inspection service of the Bureau of Air Commerce and now is with United Air Lines.

Brodie brought in a Farman plane, powered with a 50 h.p. Gnome rotary, rigged up a "student stick" between the pilot and the motor in the rear, and set out to prove to us that Standard school was not defrauding anybody.

The Farman had a large elevator out in front as well as the one in the rear. There was no cockpit; the pilot sat out in front someplace between the motor and the front elevator—changing his position to aid in balancing the plane, and placed his feet firmly on the fulcrum stick which controlled the rudder. Brodie jealously guarded his big, 40-foot wing span Farman, the only one in the United States. But that wasn't unusual; it was customary to demand a $1,000 cash deposit before allowing any student to solo somebody else's plane.

The Gnome rotary, a French motor, was popular at the time, but furnished only enough power to keep the mammoth in the air. The plane was very slow—about 50 m.p.h. top speed—but Brodie considered it the safest plane yet made—and Brodie was one of the safest flyers who ever pushed a bird off the ground. Every day, before beginning instructions to his dozen anxious students, he and Schroeder checked and re-checked the plane, then he took the Farman up alone to make certain it would still fly.

"Well, George, if you've got the guts, you can take 'your' plane up today," Brodie challenged me the day my actual time in the air totaled five hours.

A fellow with goggles and a "society" flying suit (we never learned his name at the port) had stored a home-made Curtiss in one of the school's hangars and hired me as a mechanic for $25 a week. He intended to use the plane for advertising, he said, but after visiting the field three times to pay me, he never showed up again. After a few weeks without pay I began using the plane for ground work. This plane Brodie had designated as "yours" when he said I could solo.

As I taxied roughly along the ground, I visioned the near future when I would complete two figure eights and climb to 2,000 feet to earn my license.

After running about 200 yards, I looked down between my feet and discovered I was off the ground! By the time I had reached an altitude of 500 feet, I decided this was easier than driving the old black team. Satisfaction was short, however, because the Curtiss'

exhaust was "erratic and belching black, carbon-laden smoke," just as the book said it might. The plane began to settle. Too low to jump even if I had had a parachute, I stuck with the ship.

Next thing I remember I was wrapped around the limb of a giant elm tree, the Curtiss partially buried in the ground, and Brodie climbing the tree to see if I were as badly smashed as "my" plane. I was all right except for a bump on the head, but the Curtiss was broken into about 500 pieces—if there were so many parts in a 1911 airplane. Later Brodie took me up again, and I handled his Farman for about ten minutes. I enjoyed the air as much as ever, so instructions continued.

In the fall of 1912 the Gordon Bennett cup was held at the Clearing field. The United States had built a small monoplane with a 140 h.p., French Gnome.

Glenn L. Martin was the fastest monoplane flyer here, but he hit only about 80 m.p.h. on the five-mile course marked out with steel towers. France sent three of her best flyers over here with planes, extra parts, gasoline, and oil about a month before the race. The three pilots flew the course for about two weeks, and won the race at a speed of 109 m.p.h. for a full hour. Later the same day, one pilot reached a top speed of 112 m.p.h. for two laps.

Late in the summer of 1912, Brodie was sworn in as a mail carrier, and carried the first sack of mail from Clearing to Argo, Illinois. Pathé newsreel men played up the flight as an epic in aviation—which it was. It cost me 32 cents to send a box of candy 25 miles on that flight. The newsreels were enthusiastically acclaimed, so Brodie began negotiations for a regular route which never materialized. Perhaps the first regular mail run would not have been begun in 1918 but in 1913 had Brodie lived. In April, 1913, Otto Brodie crashed from about 500 feet, and landed in a corn field with the Gnome in his back.

My disastrous first flight, followed by Brodie's unfortunate death, ended my aviation career. I was broke.

The 12 of us did the only thing possible—went home with a vow to continue our career as soon as we could enroll for another course or buy another plane. I don't know what happened to the other 11, but as for me. . . .

Well, I married the school marm who had promised she would "call the whole thing off" if I took up aviation. We decided to postpone my flying career until I had a little money saved up from farming, but six kids came so fast that now I'm lucky if I can snitch a dollar and a half from the family budget to take a ride in the new Taylorcraft at the local airport. If I ever get my four boys and two girls safely through college, I'm going to take up the career I was forced to drop in 1913. It may be a young man's game, but I'm one "old man" who would still get a whale of a kick of "revving her up" and heading for the widest open spaces in the world—the sky!

END

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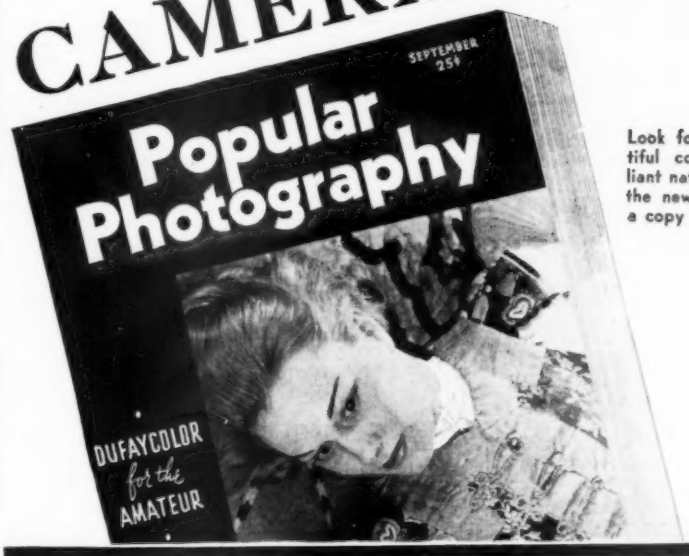

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Guinea Pig Line

(*Continued from page 32*)

They are checking in the passengers. They include, in a report form, each passenger's name, his ticket number, destination, the ground transportation desired at his destination, the number of pieces of baggage and weight, and the passenger's personal weight. It would seem that this is enough to keep the ticket agents busy during the last minutes prior to departure, but we find that they need to be prepared for unexpected situations. For example, here comes a young "lady" with a cute little Pekinese. She insists upon taking the dog with her into the cabin of the plane, and this, with his other duties, puts the ticket agent "on the spot". He must tactfully explain that it will be permissible to crate the pet and load it in the baggage compartment but that the company regulations strictly forbid the carrying of animals in the passenger cabin.

Now, it is 8:25. In five minutes the plane must taxi out for the take-off. The pilot and all the other members of the crew (navigator, flight agent and radio operator) are in their places. The flight agent, at the door of the passenger compartment, is checking over the list of pasengers as they enter, which was given him by the ticket agent.

Cargo-handlers are putting aboard passenger baggage, mail and express, also such company material as is to be carried. They are being supervised by the station agent who makes a final check as to the maximum load being carried.

As 8:30 approaches the station agent stands to the front and at one side of the plane and, when everything is in readiness, signals the fact by a snappy salute to the pilot and the plane taxies away for the take-off.

But the station agent's work is not yet done. With the flight on its way, he sends a radiogram to the various stations along the route, telling the amount and destination of the cargo aboard. In the radio room are the radio operators who receive from the navigator on the flight, a call at the first check point and also from various stops along the route.

The flight agent, an official required in the Parks Air College airline operation because of the absence of ground crews at the two stops (Terre Haute and Indianapolis) has little time to watch the changing scenery. He is busily occupied, both en route and at the stops, assuming the duties which normally would fall upon the ground crew. He must see to it that mail and express are delivered and taken aboard and that each item is properly accounted for in his reports. This is in addition to checking the passenger lists.

In the five seasons of its operation the P.A.C.A. schedules have been flown without incident except that, in a few instances, the pilot was required to delay his flight en route because of more or less severe thunderstorms. With a little experience in scheduled flying, pilots develop the ability to keep closely to schedule at control points and at each terminal. Through the application of correct principles of cruising control the completion of flights within one or two minutes of exact scheduled time becomes customary.

Opinions may vary as to the wisdom of any training program but there is at least one dependable measure of its value: that is the success of its graduates in winning acceptance in the field for which they prepared. In order that this pertinent information might be included here, the author asked for and was given access to the records. He found that of all Professional Flight and Executive graduates, 91 per cent are actively engaged in aviation, 62 per cent of the 91 per cent being in scheduled airline piloting.

The records established by Aviation Operations and Executive graduates is even better. Every one of them is engaged in air transport operations.

END

Ryan S-C Model

(*Continued from page 60*)

CONSTRUCTION OF LANDING GEAR

Care and patience should be exercised here so that you have a strong and compact landing gear. All landing gear pieces are formed from 1/16-inch spring-tempered steel wire. A small amount of shock is had in this type of landing gear as shown in detail on the side of front view of landing gear. The model is shown with streamlined "pants." These are intended only for display work and should not be used in flying the model.

The entire model is covered with a good grade of bamboo paper. In applying the paper to the framework, ordinary model airplane dope will not do. Ordinary cement, thinned out slightly, makes excellent paper cement. In order to obtain a nice covering job see that practically all wrinkles are removed.

Do not stretch paper so tightly over the frame that it will have a tendency to pull it out of shape. After the various parts have been covered, dope with water. This will cause the paper to tighten over the framework. If the brush is used, extra precautions should be taken not to tear paper.

Any small spraying device is an excellent means of applying the water. After the pieces have become thoroughly dry, clear dope them. To obtain a smooth finish, a light sanding is given between each coat. Color suggested for this model is silver with black license numbers.

It is best to keep the lacquer thin enough so that it will flow freely. This will require an extra coat but the results obtained are well worth the effort.

TESTING THE MODEL

In launching the model from the hands, it is best to find some tall grass for it to glide into, as this will prevent any serious damage in testing. Model should glide down in an even keel without falling off on one wing or the other. Any correction can easily be made with the adjustment tabs. Up and down angle of attack is corrected by moving the batteries on the adjustable sliding rack.

END

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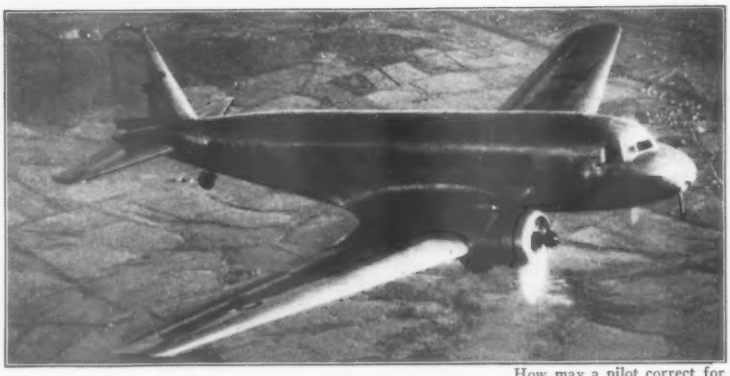

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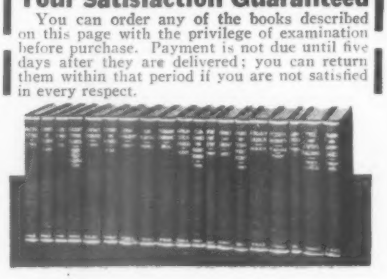

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